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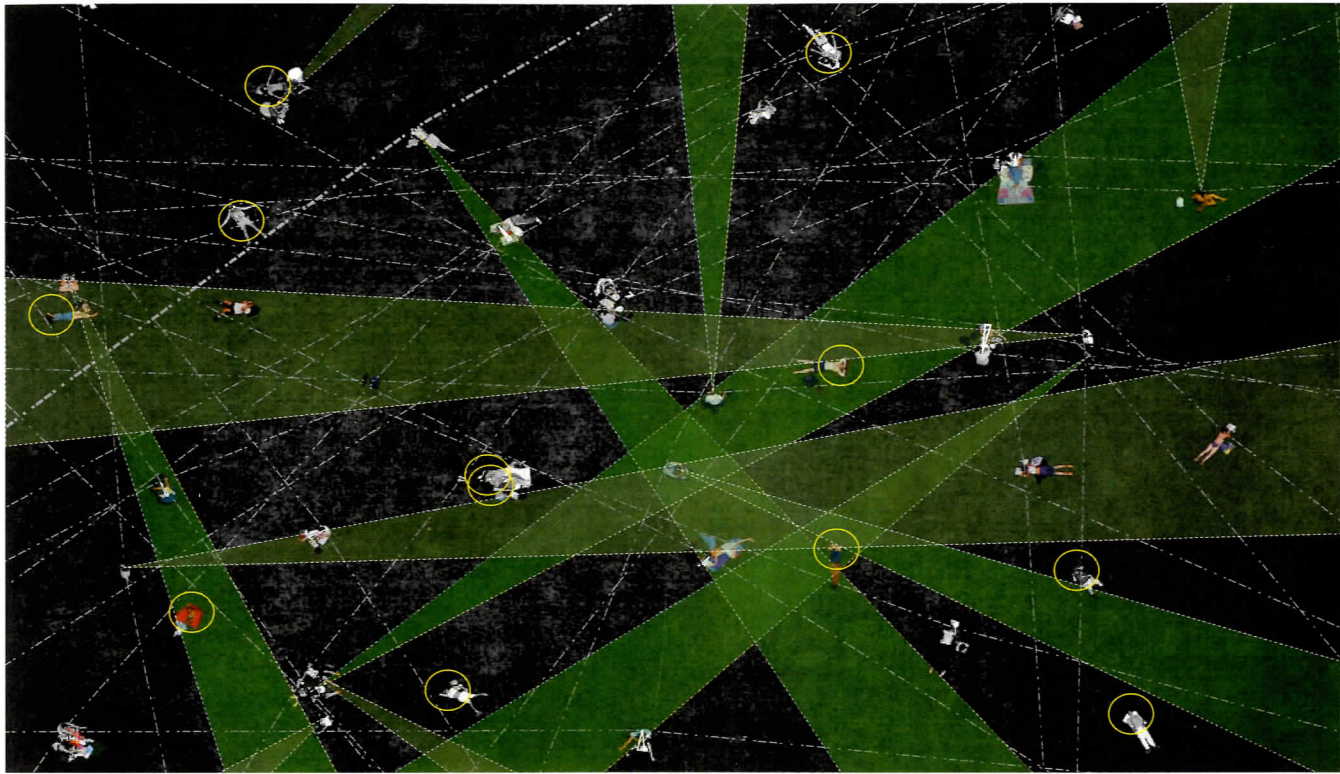
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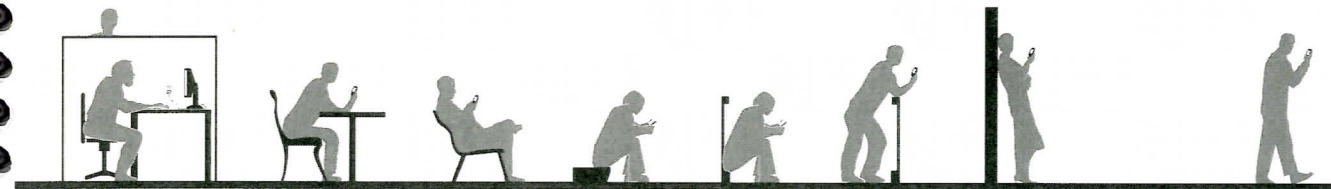
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Peripheral Architecture

james utterback

Peripheral Architecture



Thesis Prep Spring 2009
Student: James Utterback
Thesis Advisors: Brian Lonsway, Brendan Moran

Distraction: a particular form of attention,
simultaneously directed and dispersed.¹

Place: a geographically distinct location.

Non-place: a vector.

Space: a field of relationships.

Screenspace: the field of relationships within
the screen.

Screenplace: the field of relationships within
the screen and its context.

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Introduction.

A Ubiquitous Distraction

By 2012 the 4G "Anytime, Anywhere" digital age will be upon us and the air will be loaded with new possibilities for those with the hardware to tap into it.

In the latter half of the 20th century, screen-mediated technologies generated an abundance of hybrid local/peripheral places. Movie screens, televisions, and computers challenged notions of privacy, location, and place by stretching people across the screen and into the screenspace. Where screens became pervasive the architecture became passive, often acting as an experiential shield from the local space, wholly privileging the space of the screen over the context in which we receive it (Fig. 1).

Engaging Distraction / Designing an Expanded Space

The complication screenspace poses for architecture is its success: screenspace effectively rivals the stimuli of the local material world with a content and medium that is the dominate culture. Thus, when tuning in or logging on we find ourselves operating in two places at once: our geographic location and a distant televisual peripheral space. Margaret Morse terms this stretching "distraction" and defines it as "a partial loss of touch" with the "here & now"¹. This concession of a experiential capacity and the transferal of attention has led to the reduction of architectural considerations in the design of screenplaces e.g. the movie theater, the arcade, the shopping mall, the call center and the internet cafe (Fig. 1) in addition to the overt dissociative properties of the iPhone's advertisements (Fig. 2) which some suggest threatens to marginalize location further.

Yet Stan Allen offers a second understanding of distraction, one that offers an expansion of architecture rather than a retreat or transformation of the architect "into programmer of the spaces of simulation...or technician of a barely necessary frame."² Allen's proposal is that architects can appropriate and redirect "the very technologies of distraction enforced by dominant culture."³

Finding equally unsatisfactory the transformation of the architect into computer programmer or designer of frames, I will grab hold of Allen's projective spirit and pursue an appropriation of the technologies of distraction, hereby re-termed technologies of extension, in order to bring together the local and the peripheral into an interactive and simultaneous space.

In order to accomplish this goal I will investigate the normative condition of screenspace as it occurs within the non-space. The non-space, a vector, is a tabula rasa enabling a catalogue of the spatial, material, and experiential qualities people carve from the non-place upon their engagement with the screen. This database of observations will provide the raw information needed for an appropriation and redirection of those reductive and defensive normative conditions into a space of expanded and extended inter-activities centered upon the screenplace experience.

1 Margaret Morse, *Virtualities: Television, Media Art, and Cyberculture*, Bloomington: Indiana

University Press, 1998. p.99

2 Stan Allen, "Dazed and Confused". *Assemblage* 27 (1995):47-54. p.51

3 Ibid. p.53

Peripheral Architecture

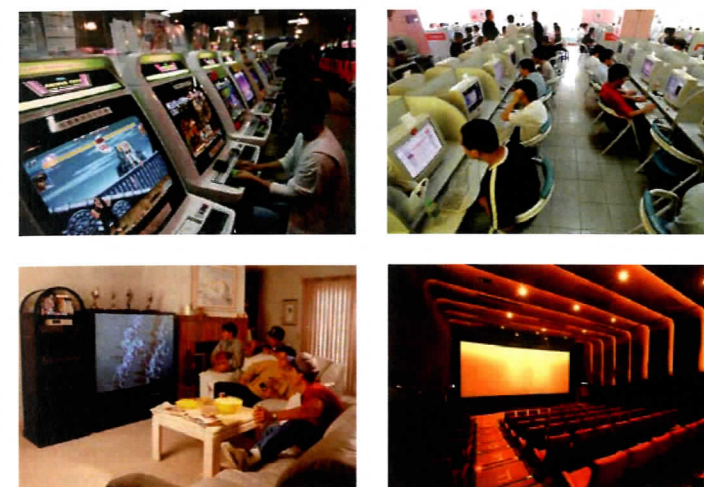


Figure 1: Screens in Context

Arcade, Internet Cafe, TV room, Movie Theater. The stationary hardware was the focus and the impetus for the design of its surroundings.



Figure 2: Screens vs. Context

The iPhone screen is the place of activity, its context disregarded. The black backdrop refers to both a contextual indeterminacy (suggestive of its mobility), and as a stark contrast to the potential of the screen (its multiple platforms of phone, camera, entertainment system, and information library, necessitates little else).

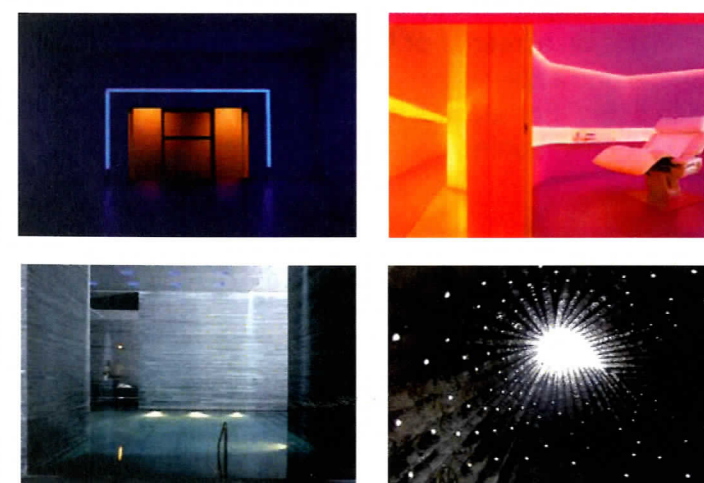


Figure 3: Immersive Contexts

Where mobile screens persist architecture's greatest contribution is "placing" people in a sensual material environment. Clockwise: James Turrell's "First Moment", The Apartment's "Yelo", Zumthor's "Vals" and "Claus Chapel"

On Distraction: The Case for Peripheral Experience in a World Focused on Peripheral Devices.

In "The Ontology of Distraction," Margaret Morse critiques the television as a "locus of...a *fiction effect*, that is, a partial loss of touch with the here-and-now, dubbed here as distraction."¹ Her critique is based upon two presuppositions:

- 1) distraction is a negative and passive condition
- 2) the experience of the screen is distinct from and at odds with the experience of the non-screen

Neither history, reality, nor society concedes these presuppositions and a new conceptualization of distraction will be explored herein, one where distraction is an active force, not a passive condition; an extension of, rather than the superimposition, of experience. At stake is the expansion or constriction of our being and an expansion or constriction of the role of the architect.

Passive Distraction

Stan Allen, in his lecture published under the title of "Dazed and Confused,"² distinguishes between two modes of distraction: the passive condition and the active force. First let us discuss the passive condition. The passive condition is a state of detachment. It is aligned with Morse's notion of distraction. Distraction as detachment is a condition that undermines one's experience of reality or Morse's "here-and-now." This is exemplary in the distraction of the driver, the shopper, and the television viewer. These individuals, Morse argues, experience a disjuncture between the mind and body; their bodies run on autopilot, operating through muscle-memory and proprioception while their minds drift through the screen of the windshield, storefront, or television screen. For Morse, passing through the screen causes a degradation of awareness and experience, a degradation of the unity of our faculties required for Heideggerian being. For architecture, which is at its core an articulation of our being in the world and a strengthening of our sense of reality and self,³ distraction as a passive condition is anathema.

- 1 Margaret Morse, *Virtualities: Television, Media Art, and Cyberculture*. Bloomington: Indiana University Press, 1998. p.99
- 2 Stan Allen, "Dazed and Confused". *Assemblage* 27 (1995):47-54.
- 3 Juhani Pallasmaa, *The Eyes of the Skin*. Chicester, UK: John Wiley & Sons Ltd., 2005. p.11

Activating Distraction

There is yet the other mode of distraction: the active force to which Allen alludes. In "The Work of Art in the Age of Mechanical Production," Walter Benjamin writes that "the reception [of architecture] is consumed by a collectivity in a state of distraction."⁴ The form of that reception is twofold: that of sight and that of touch, and our "tactile appropriation is accomplished not so much by attention as by habit."⁵ Habit, automation, practice. For Benjamin, the experience of architecture occurs through distraction and the separation of mind and body that Morse fears and critiques as a loss of experience, is understood by Benjamin as the very stuff of experience. And so it is suggested that distraction has the potential to expand upon our knowledge of the world. When we cross the threshold of the screen, stretch ourselves in mind and body, there exists the opportunity to enhance our experience and expand beyond our corporeal limitations.

Expansion

A late 19th century writer named Max Nordau anticipated that by the year 2000 people might be able to "read a dozen square yards of newspapers daily, to be constantly on the telephone, to be thinking simultaneously of the five continents of the world"⁶ without injury to the nerves. And so it seems we are approaching this reality as we function across platforms, across screens, and across spectacles connecting the continents and streaming our daily lives.

Why must our experience operate within the dialectic screen/place with the screen as our mind extends to a peripheral place? In a world of artificial and peripheral components it has been exhaustively documented that people project themselves onto and through devices that are not themselves. When an amputee receives an artificial limb, there is a propensity for identifying with and indeed feeling that inorganic replacement. In terms of our relationship with technology peripheral devices such as PDA's have already begun taking on aspects of our person as described by David Chalmers in his introduction to Andy Clark's *Supersizing the Mind*: "My iPhone is not my tool, or at least it is not wholly my tool. Parts of it have become parts of me." The problem of the screen in architecture is the problematizing of the screen by architects. The screenplace is an important and rapidly expanding part of the human condition that holds opportunities for those who seek them.

- 4 Walter Benjamin, "The Work of Art in the Age of Mechanical Production" in *Illuminations* ed. Hannah Arendt, trans. Harry Zohn. New York: Schocken, 1968. p. 239
- 5 Ibid. p. 240
- 6 Stephen Kern, *The Culture of Time and Space*. Cambridge: Harvard University Press, 1983. p.124

History of the Screenplace

The impact of the screen on architecture has largely been one of opposition, marginalization, and superimposition.

In 1927 the Roxy Theater was transformed into one of the United States earliest movie theaters. It is an ironic beginning for researching the screenplace. Its baroque design, employed to provoke a dematerialization of public/private, performer/audience, and fantasy/reality dialectics, would frame the beginning of a medium which would lead to the dematerialization of architecture itself. In 1933, the first Drive-In theater would be built in Camden, New Jersey. The caption accompanying its advertisement in *Popular Science* reads: "Occupants of a car may chat or smoke without fear of disturbing others since their car is for practical purposes a private theater box."¹

As the screen became smaller its privatization became a possibility realized through television. While the content was publicly distributed the screen itself became the property of private individuals rather than public companies or communities. Furthermore, its size enabled its opportunistic situating into most any space from the family room to the bathroom.

All the while, the movie theater moved from the charged multipurpose baroque environment to the placid monomaniacal multiplex. At each iteration of theater design, unobstructed views, universal acoustics, and a design of ever greater devotion to the screen was enacted.

Today, in the office and internet cafe culture the unchallenged devotion to the screen has been perfected. Literal blinders have been built around individual computers, to the optimization of space efficiency. Proximity without consequence. A place without context.

Yet users have begun to enact their rejection of these sterile bounds by occupying new locations thanks to new mobility. Bustling cafe's and wide open parks such as Bryant Park have replaced the internet kiosk. People are simultaneously suggesting new qualities in the design of screenplace and expanded potentials of interaction. Distraction moves way for expansion.

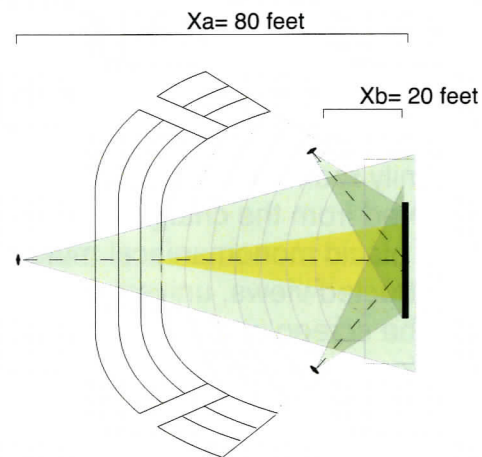
¹ Hollingshed Drive-In Theater. Movie Theater Lets Cars Drive Right In. *Popular Science*. August 1933

Movie Theater: The Roxy

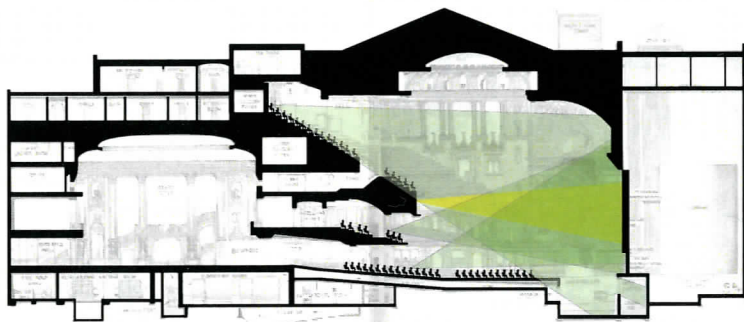


Roxy Theater New York City,
1927 -1960

Plan

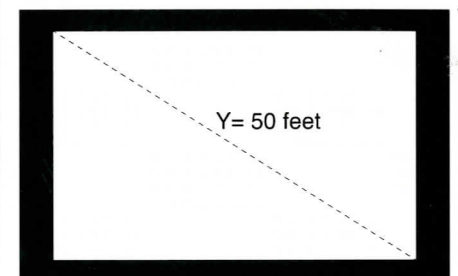


Section



The early movie theater was a retrofitted live performance theater. Seating was more widely dispersed than contemporary theaters which meant seat location and context played a much greater role in the overall experience.

Screen Size

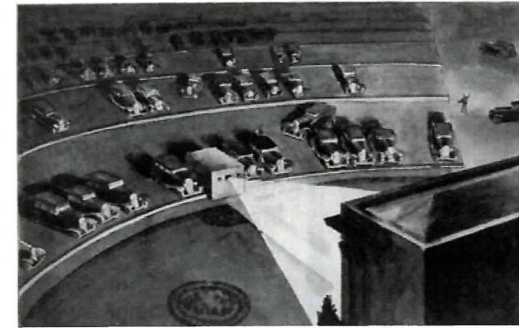


Spatial Relation to Viewer

$$\begin{aligned} Xa/6 &= H_{min} \\ Xb/2 &= H_{max} \end{aligned}$$

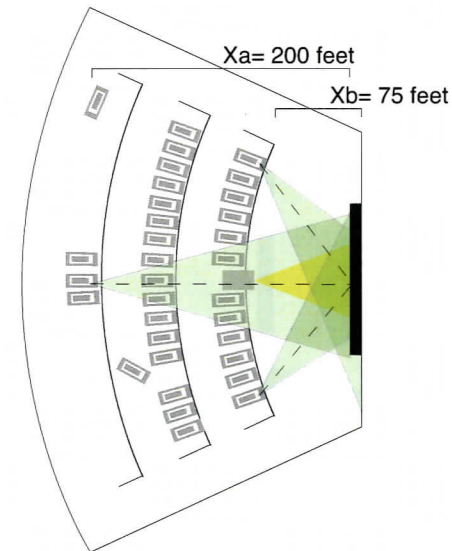
* fields of vision are 60 degrees

Drive-In Theater

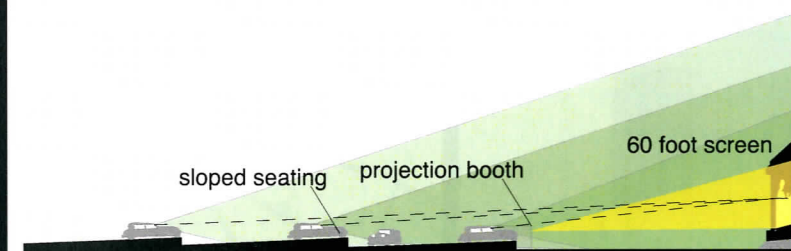


Hollingshed Drive In Theater Camden NJ,
1933

Plan



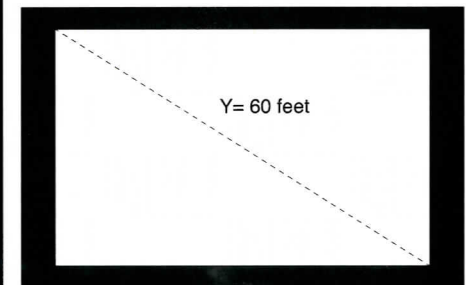
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"Occupants of a car may chat or smoke without fear of disturbing others since their car is for practical purposes a private theater box."

The car of the Drive-In theater carved privacy out of the public space. The larger screen enabled greater distance from which to view as well as more space between viewers. This de-emphasized the social relationships created by performance theaters. Spatial relations were also trivialized by the uniformity of acoustic experience as each car was provided its own speaker.

Screen Size

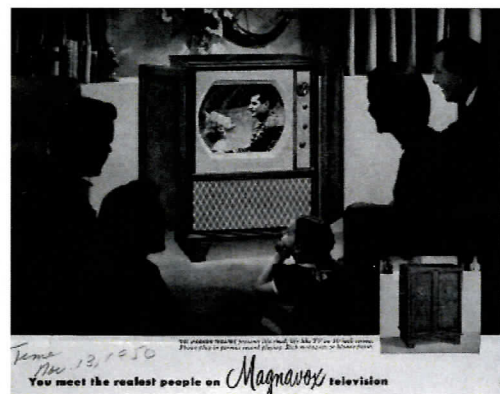


Spatial Relation to Viewer

$$\begin{aligned} Xa/6 &= H_{min} \\ Xb/2 &= H_{max} \end{aligned}$$

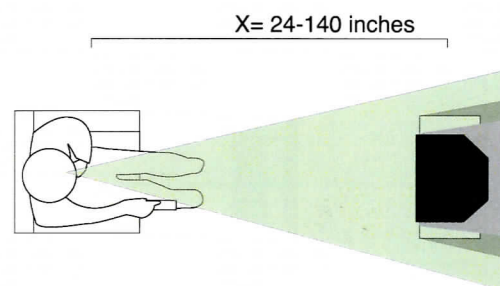
* fields of vision are 60 degrees

Home Theater

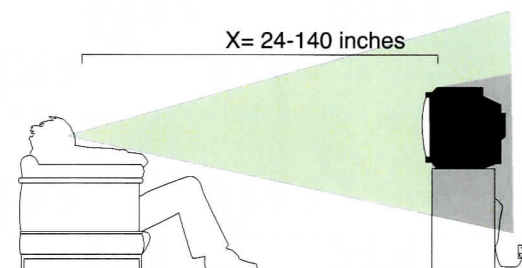


The Modern Theater: Magnavox TV, 1950

Plan

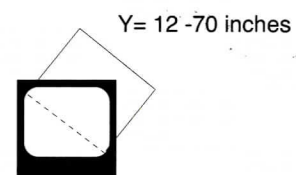


Section



The Home Theater privatized the screen and brought it into closer proximity with its viewer(s). While the screen continued to be a communal focal point, the community was limited to closer spatial and social relations, often family and friends. Its location quickly migrated from the main living to being retrofitted into any and all other rooms. Televisions were in bedrooms and bathrooms, kitchens, and basements. This ad hoc dissemination into increasingly personal and private spaces underscores a disregard for context and the socio-spatial relations of theater origins.

Screen Size

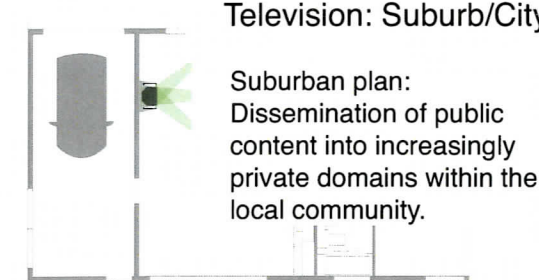
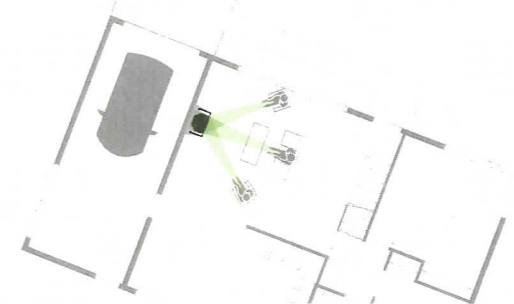
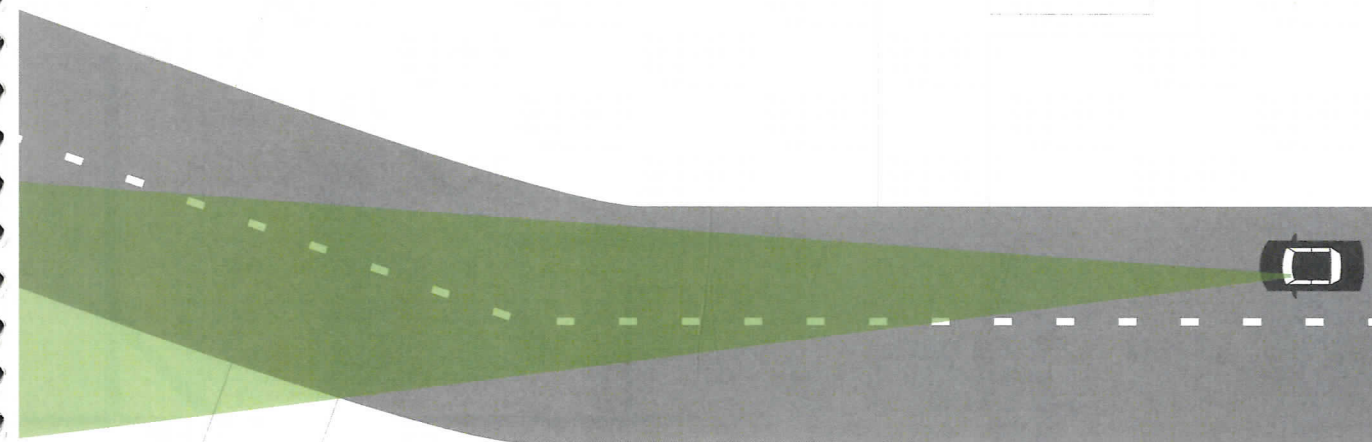
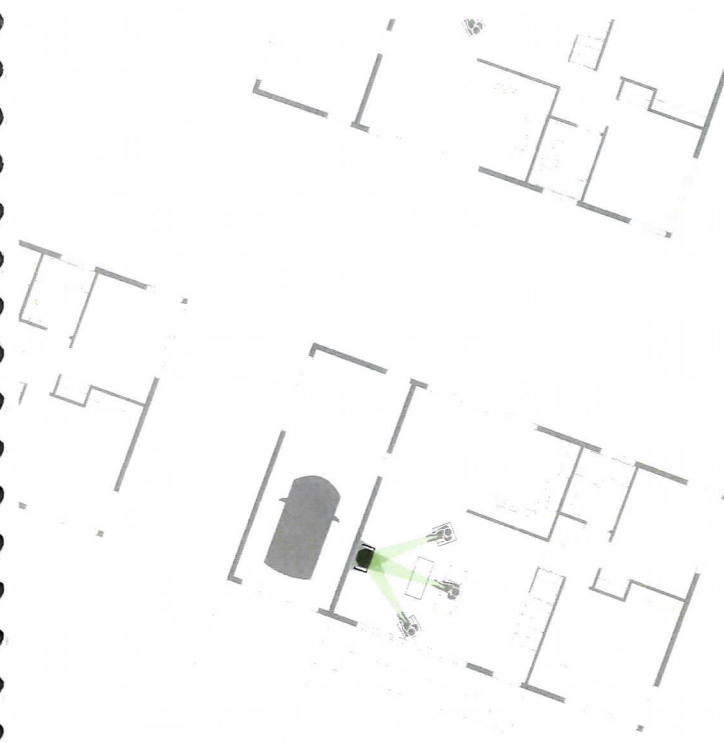


Spatial Relation to Viewer

$$Y = [1.5, 2] \cdot X$$

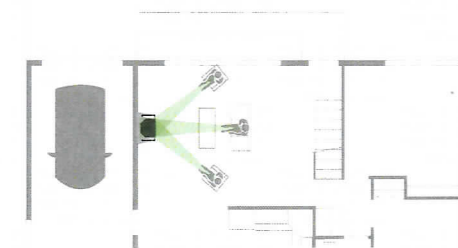
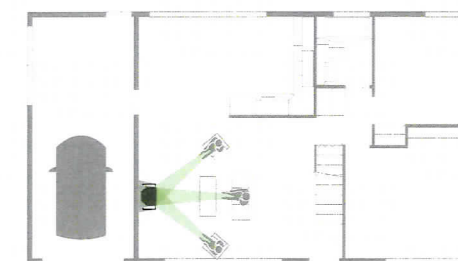
* fields of vision are 60 degrees

Peripheral Architecture



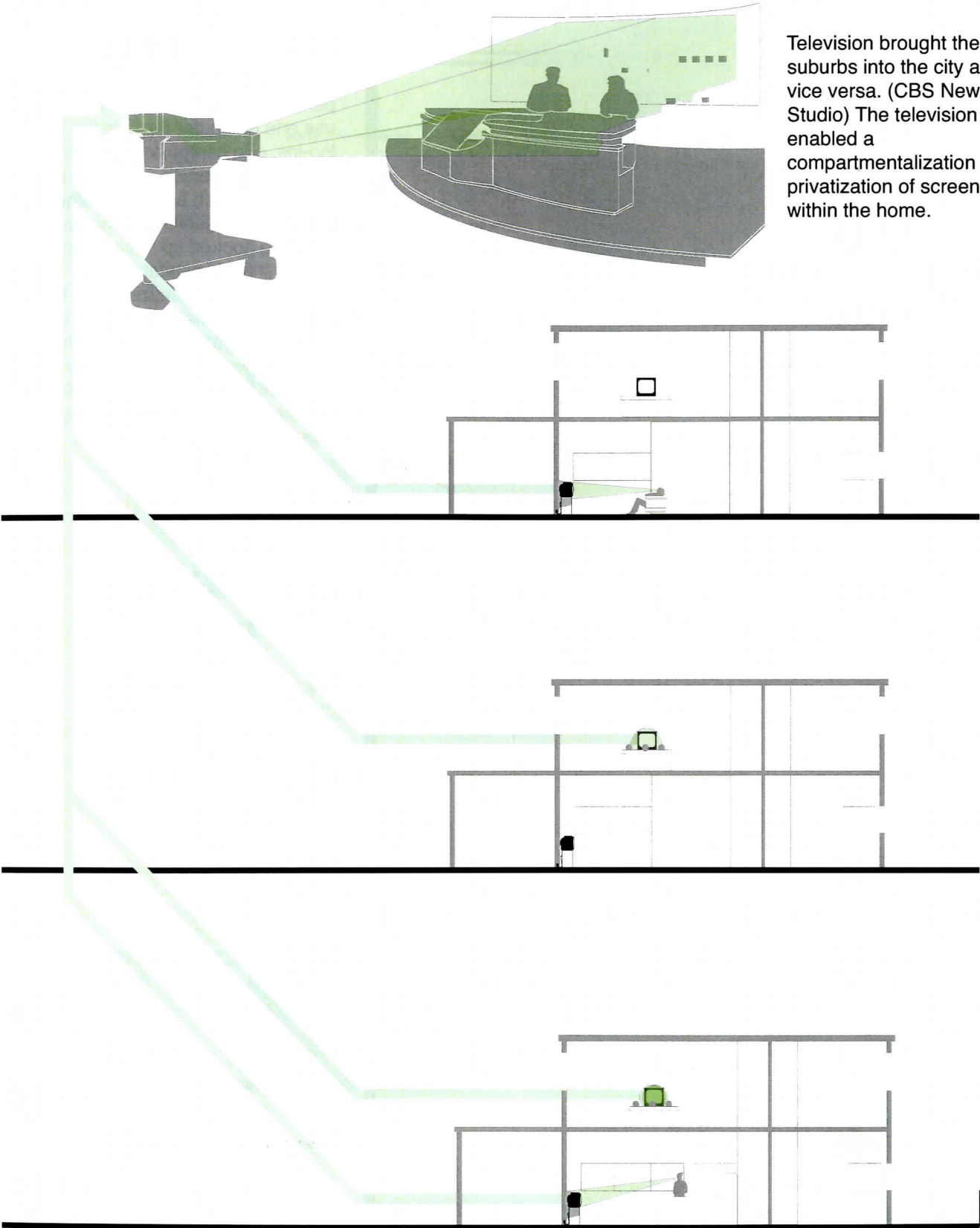
Television: Suburb/City

Suburban plan:
 Dissemination of public
 content into increasingly
 private domains within the
 local community.



Television: Suburb/City

Television brought the suburbs into the city and vice versa. (CBS News Studio) The television enabled a compartmentalization and privatization of screenplace within the home.

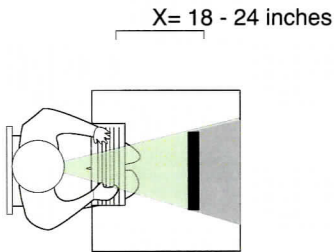


Desktop Personal Computer

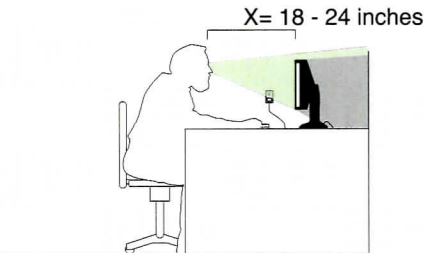


First Commercial Desktop Computer, Apple II 1976

Plan

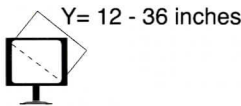


Section



The next major incarnation of the screen was the Personal Computer. The personal computer was designed and understood as personal. While multiple people could use one computer through the use of log-ins, one computer could only be used by one person at a time (some exceptions such as entertainment). However, via servers, computers could be hooked up to one another for the sharing of information. Computers start realizing new forms of networking that begin to tie distant locations together. However, these locations were still often highly dematerialized as is the case for the cubicle and internet cafe through the use of half-walls and blinders.

Screen Size



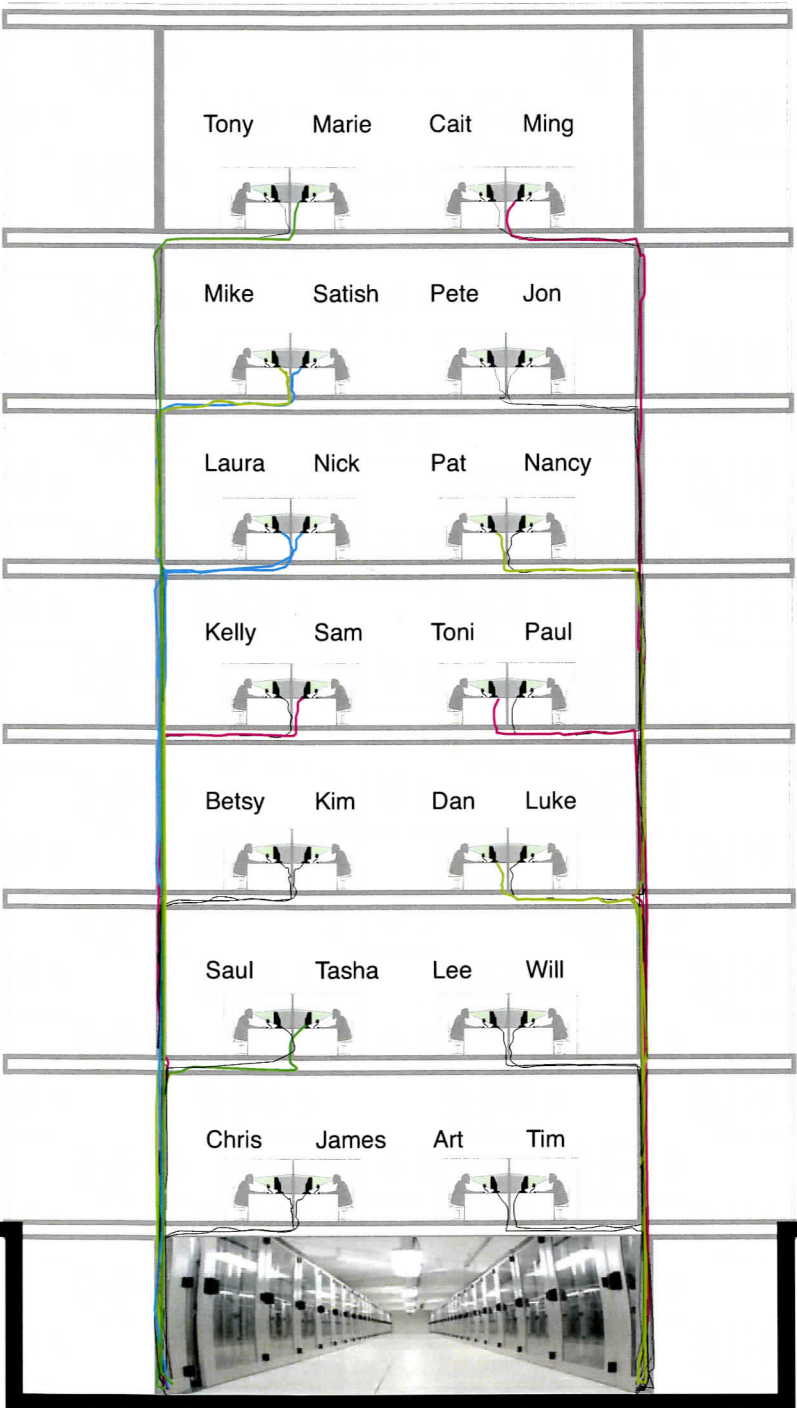
Spatial Relation to Viewer

$$Y = [1.5, 2] \cdot X$$

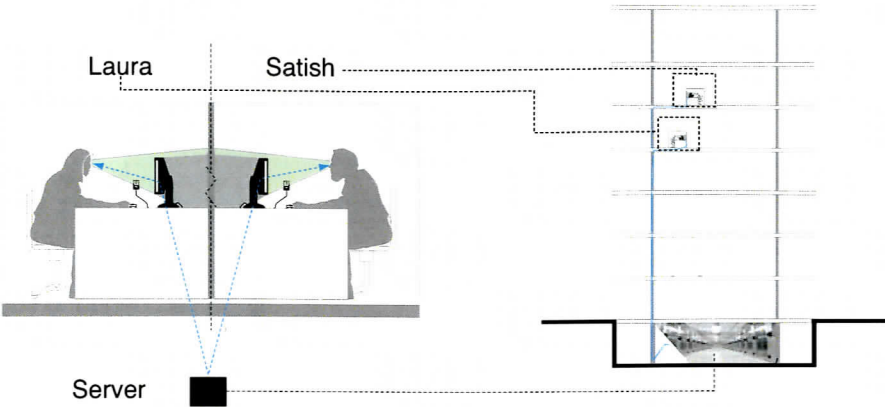
* fields of vision are 60 degrees

Desktop Computer: Inter-Office Communications

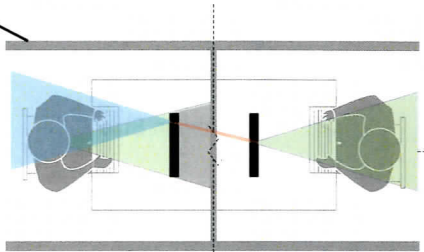
The networked computer enabled people to share information and communicate from remote locations via hard and softwares. However, just as new spatial and social connections were being made the design of the office as a series of cubicles privileged screenspace over contextual awareness through the use of half-walls.



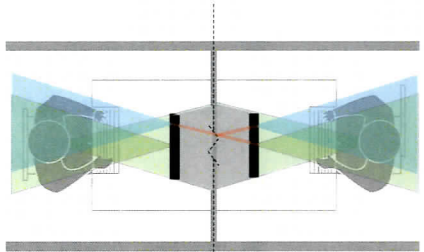
Laura and Satish at their Screens



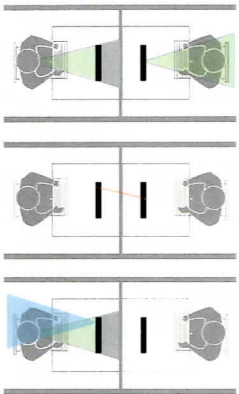
Laura Watches Satish



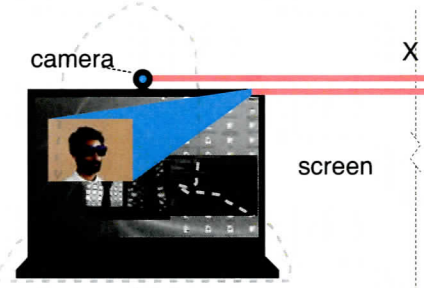
Reciprical Vision



Laura Satish

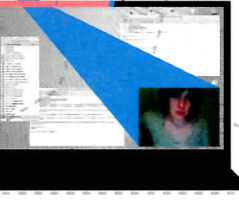


Satish on Laura's Screen



screen

camera



Laura on Satish's screen

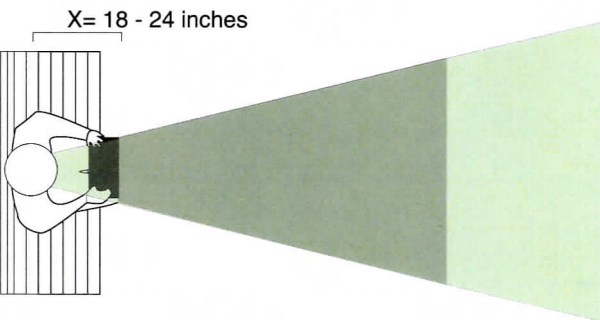
for any distance X, Time = Y

Laptop Computer

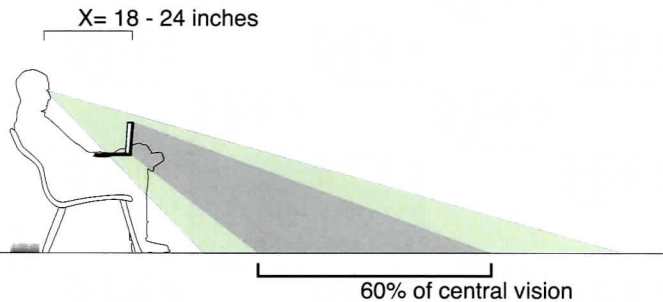


First Laptop Notebook Computer, NEC UltraLite 1988

Plan

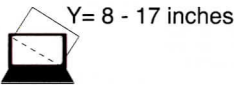


Section



The Laptop Computer took the private screen into the public domain. As people become less tied down they began to congregate in new environments with new spatial qualities. The networked park and coffeehouse emerged (Starbucks is one of the U.S.'s largest distributor of wifi access). While this pervasive computing might at first seem the ultimate triumph over context it has in fact begun to suggest a revival of context as people seek out similar conditions for their screenplace experience.

Screen Size



Spatial Relation to Viewer

$$Y = [1.5, 2] \cdot X$$

Problem: viewing at recommended distance impossible for use (exceeds length of arm)

Result: screen gets closer and takes up larger portion of visual field

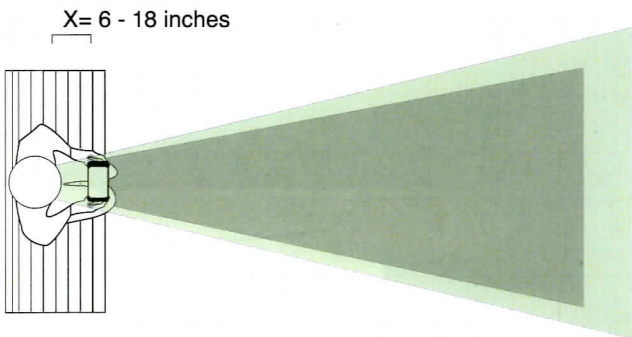
* fields of vision are 60 degrees

Personal Digital Assistant

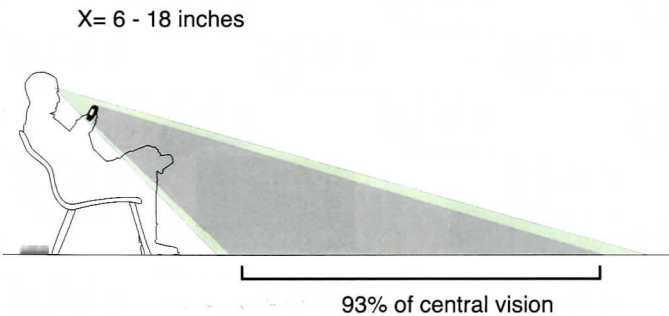


First Personal Digital Assistant Phone, Nokia 9000 Communicator 1996

Plan

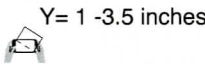


Section



The latest leap in televisual technology, the Personal Digital Assistant, requires neither a desk, a lap, or a chair. It is the ultimate in spatially and socially untied screen engagement. Yet, like the emergence of places frequented by laptop users, PDAs and cell phone use initiates a search for a new momentary spatial and social condition as will be demonstrated in the next section.

Screen Size



Spatial Relation to Viewer

$$Y = [1.5, 2] \cdot X$$

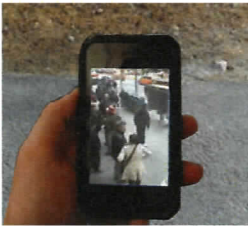
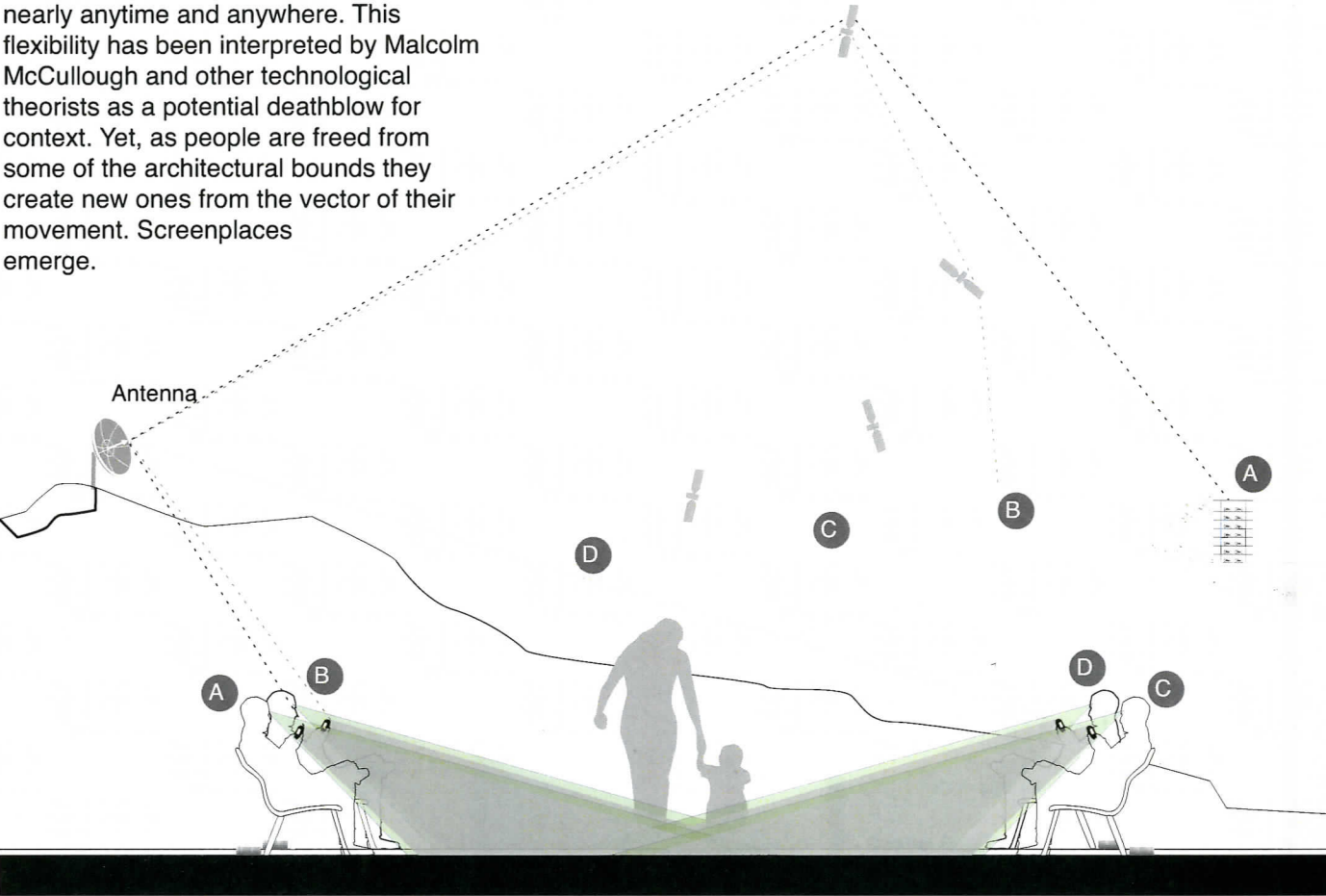
Problem: viewing at recommended distance impossible for use (exceeds length of arm)

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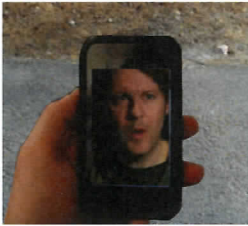
* fields of vision are 60 degrees

Laptop/Personal Digital Assistant+Wireless Coverage

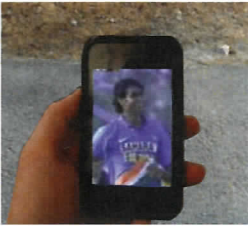
With the increased mobility of hardware and a greater range of wireless connection, the screenplace can occur nearly anytime and anywhere. This flexibility has been interpreted by Malcolm McCullough and other technological theorists as a potential deathblow for context. Yet, as people are freed from some of the architectural bounds they create new ones from the vector of their movement. Screenplaces emerge.



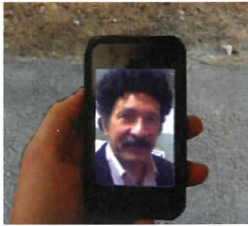
A Times Square



B Seattle Concert



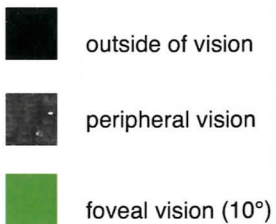
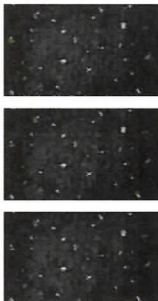
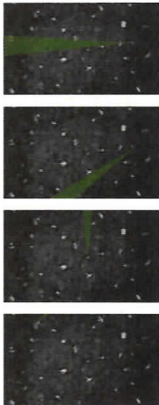
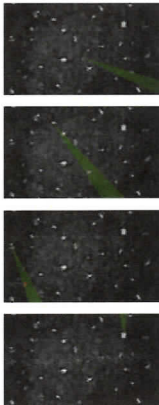
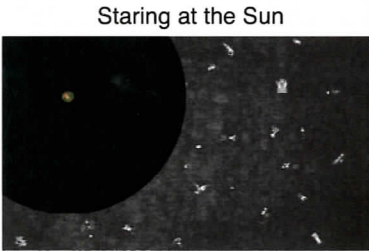
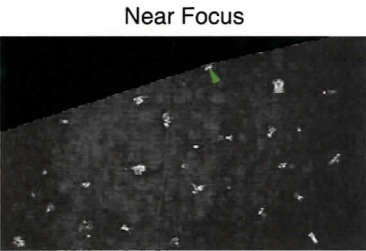
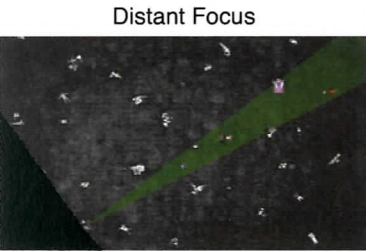
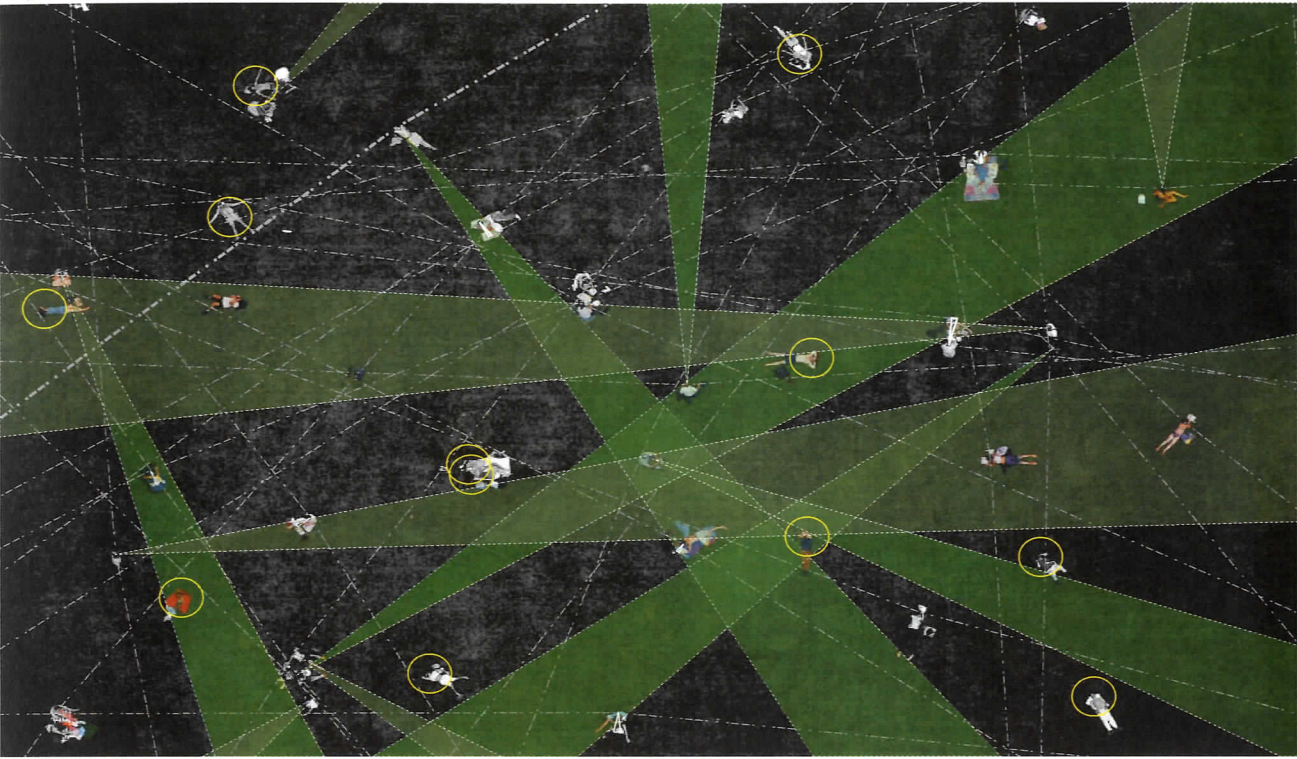
C Mumbai Cricket Field



D Australia Video Message

Laptop/Personal Digital Assistant+Wireless Coverage

Bryant Park NYC 2002, Vincent Laforte (underlay)



Emerging Screenplaces.

A sudden screen engagement transforms the non-place from a vector to a field and from that field objects and spatial conditions and are selected for the screenplace.

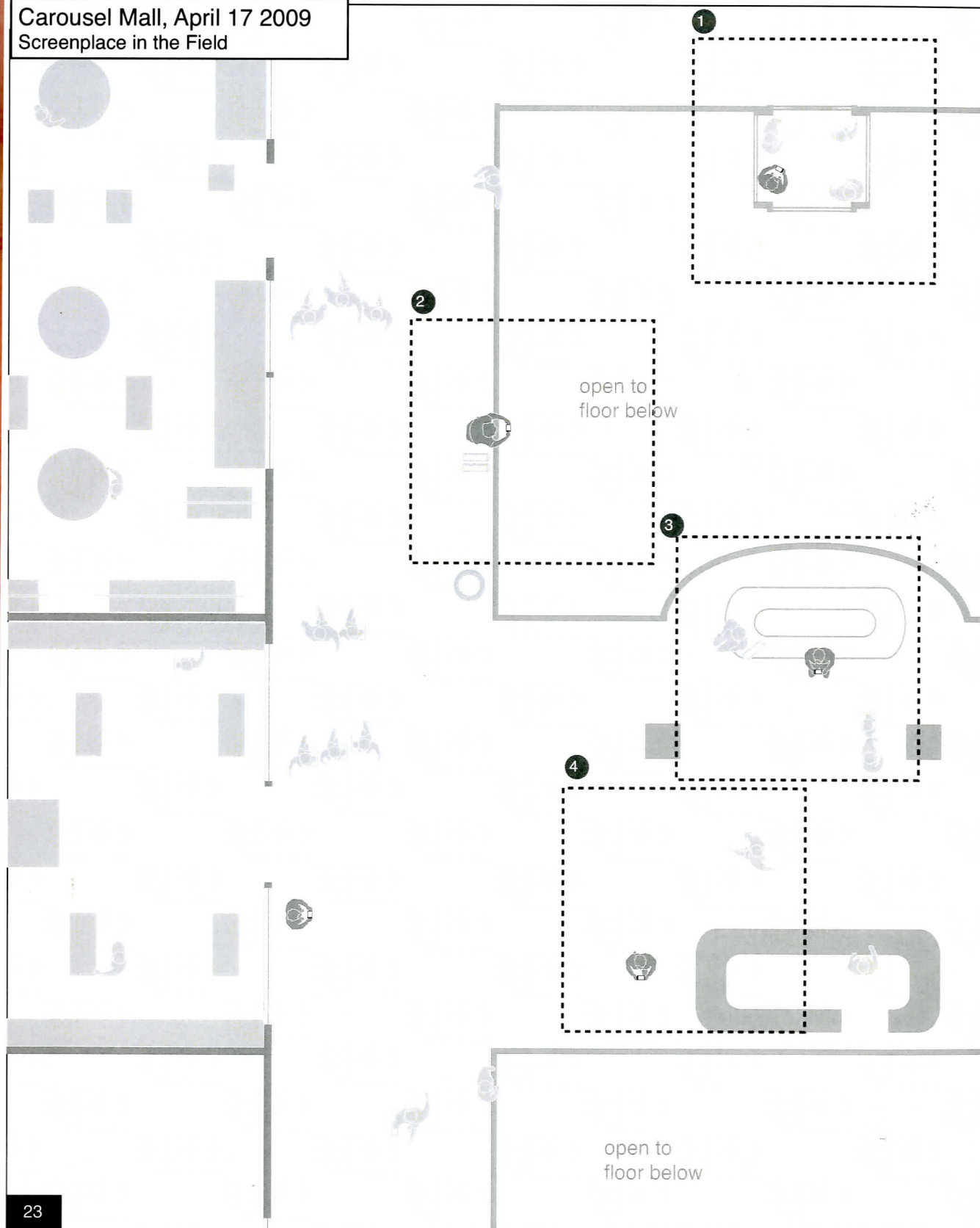
The reductive position that held architecture's role within the screenplace -- to be that of the servant: unseen, unheard, and unrealized -- is actively being undone. Properties and spaces within the everyday are being exhumed from their banality by the emergence of the screen. Nowhere is this transition more transparent than in the realm of the nonspace. Margaret Morse, working from a recent and growing breadth of philosophical, anthropological and cultural explorations of 20th and 21st century space, defines the nonspace as a place of "both experience and representation, an elsewhere which inhabits the everyday." It is the space where practices and skills are performed semiautomatically in a distracted state, practices such as driving, shopping, or television watching. It is within these nonspaces that the screenplace so often emerges and it is the appropriation of banality towards new functions or purpose that marks the importance of architectural qualities such as form, material, and spatial relations.

I have identified three locations as nonspaces or vectors: Penn Station, Carousel Mall, and the corner of Marshall Street and University Avenue. Penn Station, located in New York City is a quintessential space of transition. Occupants navigate its large halls, winding corridors, and open waiting rooms in a semiautomatic and distracted state. The second location is the atrium of Carousel Mall, located in Syracuse, New York. Carousel Mall is a regional consumer megaplex where shoppers patrol the halls, gazing through the storefront windows in a manner exhibiting the

very definition of Morse's use of the word distraction. Lastly, I choose the corner of Marshall Street and University Avenue. This is one of the busier pedestrian intersections within the city of Syracuse and is importantly also the sight of a Starbucks: a popular location for premeditated screenplaces.

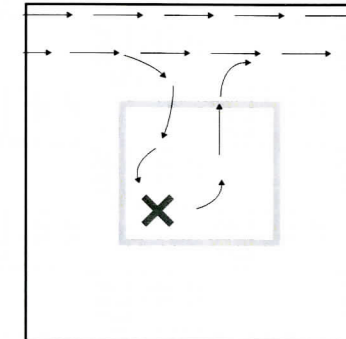
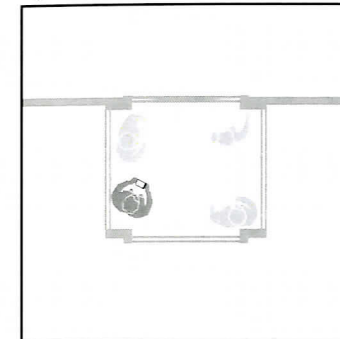
Within these three nonspaces I have observed the emergence of the screen, primarily in the form of the PDA and cell phone, and catalogued its effect in a series of diagrams. Each case study is a synthesis of hours of data, but displayed as a single moment. These studies first explore the location of the screenplace in the field, their relation to one another and lastly the spatial or object based conditions that existed therein.

Carousel Mall, April 17 2009
Screenplace in the Field

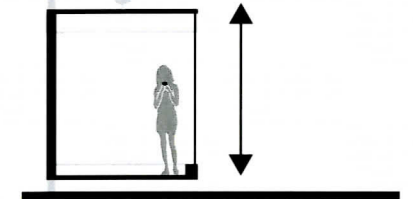


Carousel Mall, April 17 2009
Appropriated Conditions

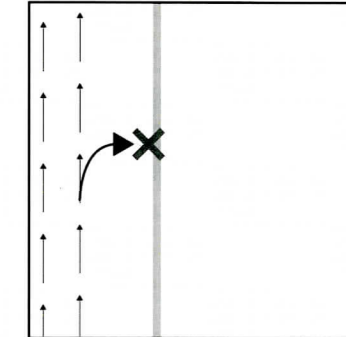
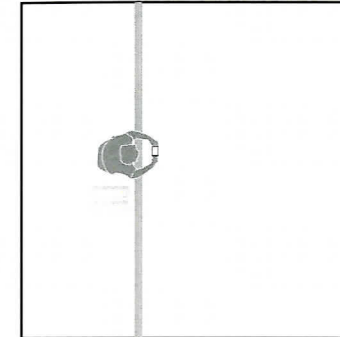
1 Passive Transit



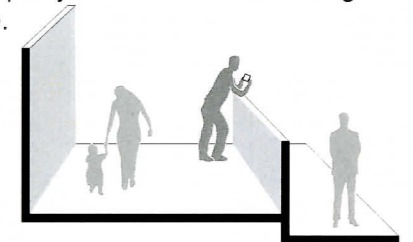
Modes of transit in which no movement is required by the transported is akin to waiting space and likewise a prominent screenspace



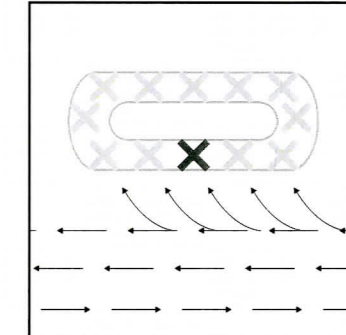
2 Ledge



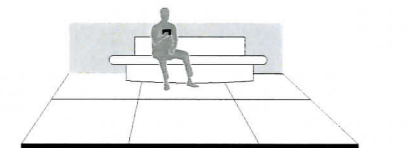
Railings, ledges and other surfaces act as supports less committal than chairs but equally effective in delineating a place.



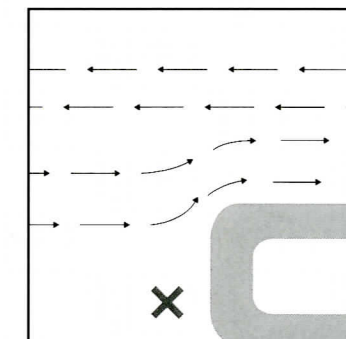
3 Reprieve



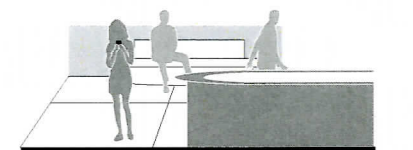
Amidst vectors there are elements which suggest a reprieve from transit. During these reprieves screenspace often occurs.



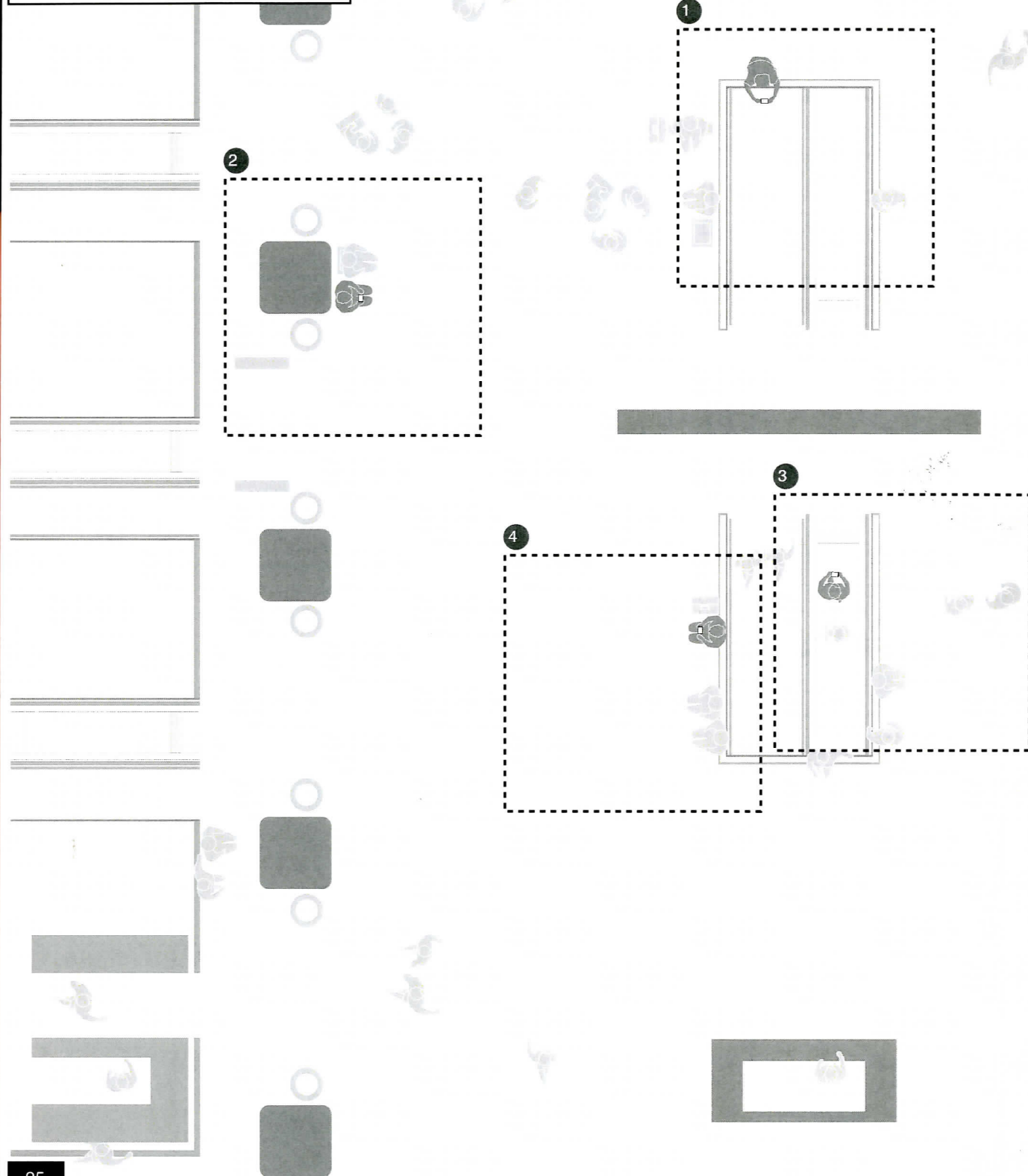
4 Shield



Like nooks, obstacles within the non-place can act as shields from the on-going transitions in which others are participating.

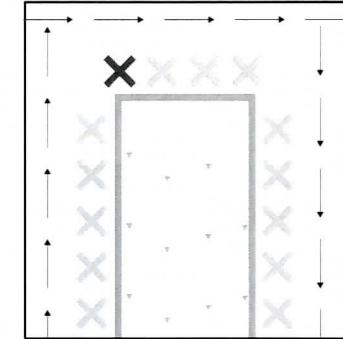
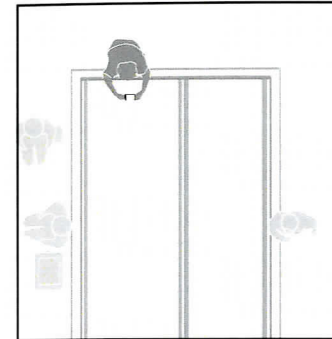


Penn Station, April 24 2009
Screenplace in the Field

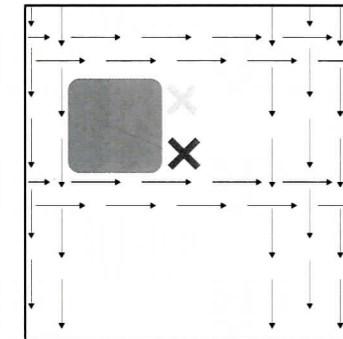
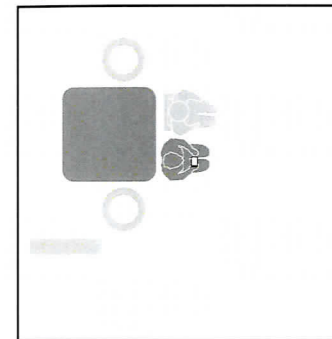


Penn Station, April 24 2009
Appropriated Conditions

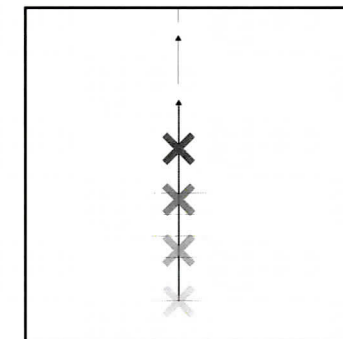
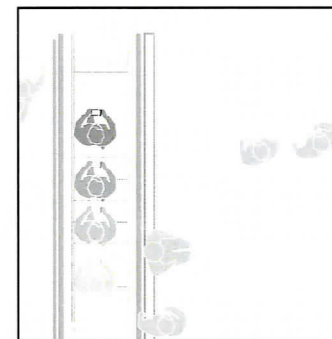
1 Ledge



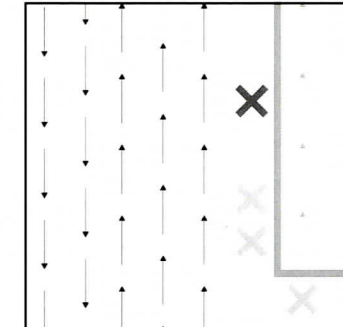
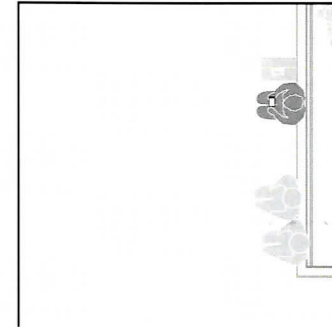
2 Shield



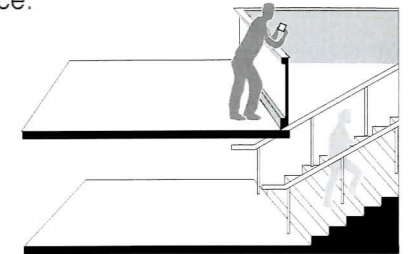
3 Passive Transit



4 Reprieve



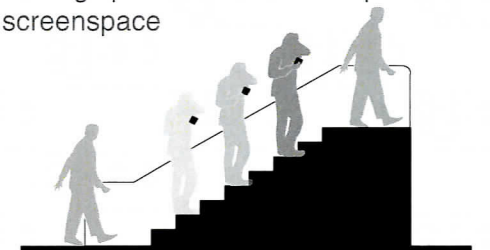
Railings, ledges and other surfaces act as supports less committal than chairs but equally effective in delineating a place.



Like nooks, obstacles within the non-place can act as shields from the on-going transitions in which others are participating.



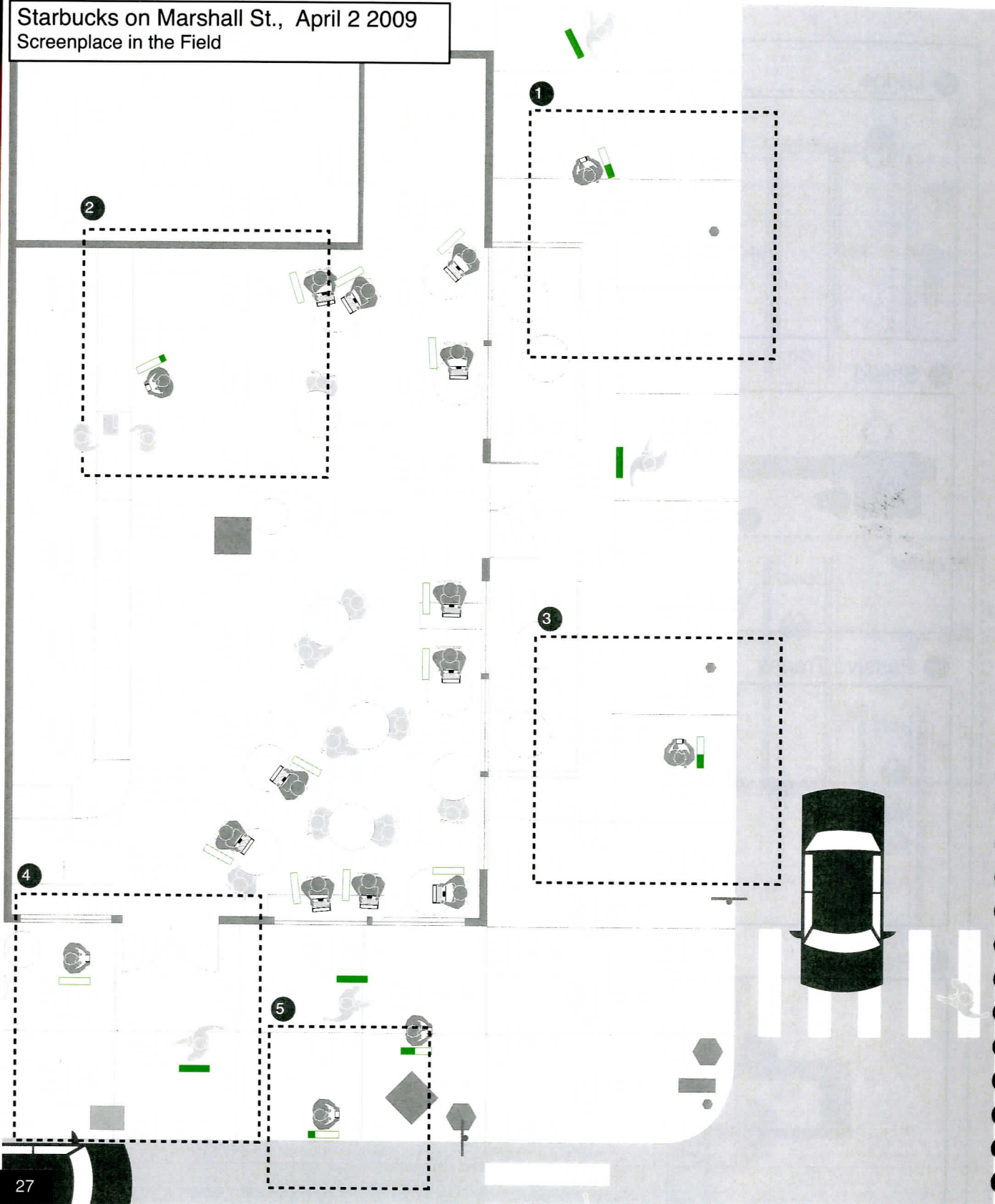
Modes of transit in which no movement is required by the transported is akin to waiting space and likewise a prominent screenspace



Amidst vectors there are elements which suggest a reprieve from transit. Tiny ledges such as this offer a reprieve from the pedestrian flow and a place to sit and wait for the train.

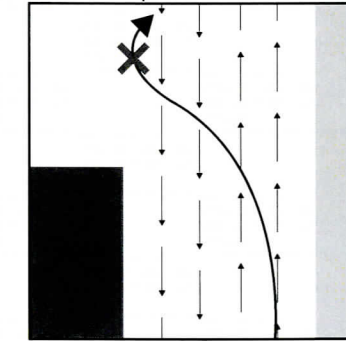
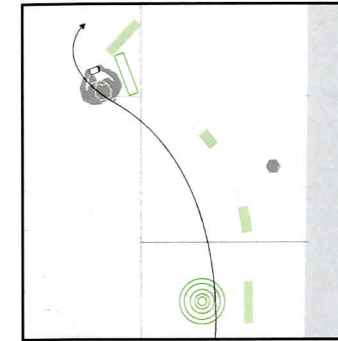


Starbucks on Marshall St., April 2 2009
Screenplace in the Field

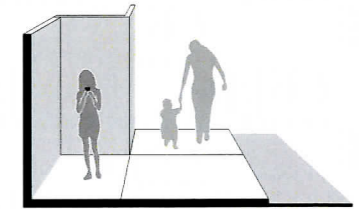


Starbucks on Marshall St., April 2 2009
Appropriated Conditions

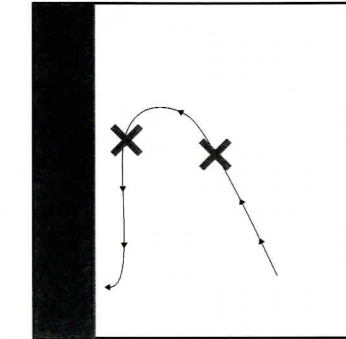
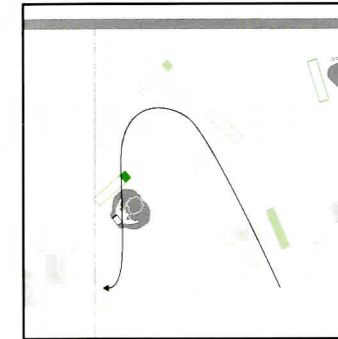
1 Nooks



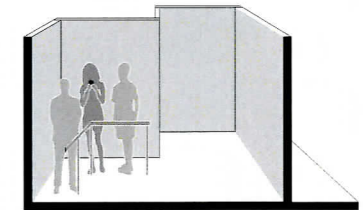
Nooks provide moments of pause and relative privacy within the vector of the non-place.



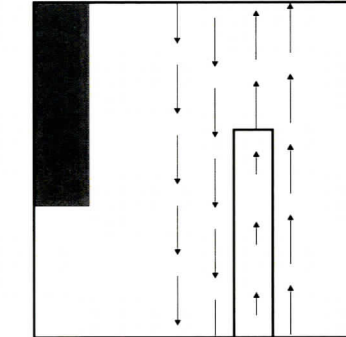
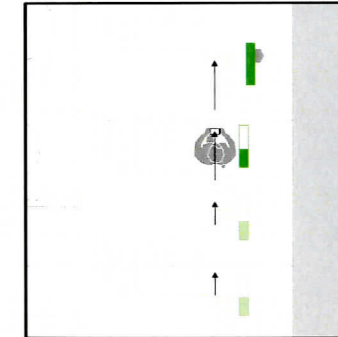
2 Waiting



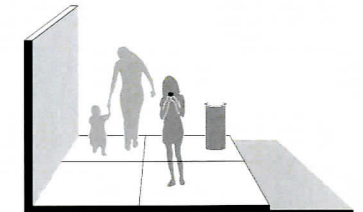
The condition of waiting often becomes an opportunity for screen engagement while awaiting an action or destination.



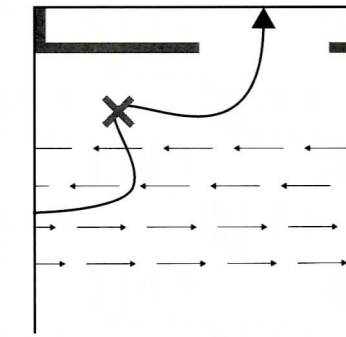
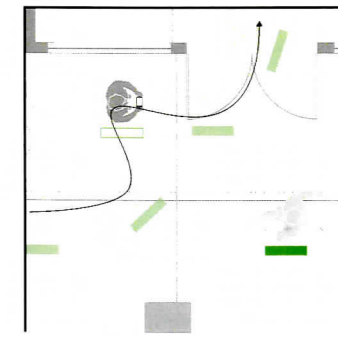
3 Midstream Stall



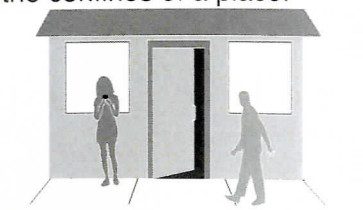
Sometimes the non-place is occupied and navigated simultaneously with the screenspace.



4 Thresholds

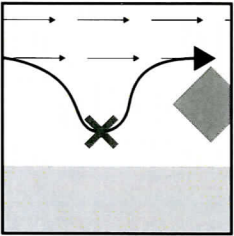
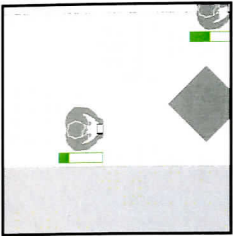


Thresholds are a decisive moment between non-places and places. Non-places can offer a quick retreat from the confines of a place.

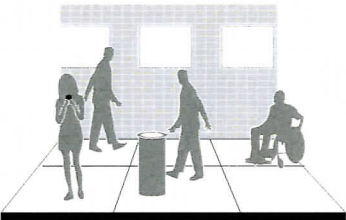


Starbucks on Marshall St., April 2 2009
Appropriated Conditions

5 Shields



Like nooks, obstacles within the non-place can act as shelters from the on-going spatial transitions in which others are participating.



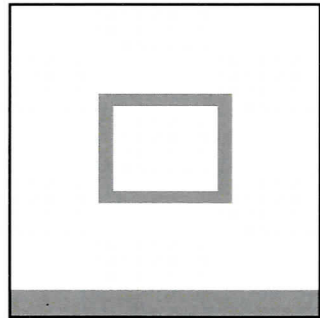
Screenplace Materiality

When the user of a screen integrates objects and forms into their screenplace they construct a peripheral experience which the architect can exploit for the expansion and cohesion of sensorial experience.

Within these case studies several appropriations emerged as typical: objects were routinely appropriated for their use as physical supports for their hardware or person or as a defensive measure against the variable flow of circulation.

The repeated appropriation of mundane objects for particular effect begins to inform criteria and considerations in the design of screenplaces. The formal and material properties which accompany the experience of the screenspace further establishes a database from which one can seek a heightened engagement with the peripheral that might compliment or complicate the screenspace in a more experiential robust screenplace. A sensorial investigation into the materiality of the screen and the device it is embedded in uncovers relations of the appropriated peripheral objects.

1 Screen Objects



Screen Objects of the mobile era are thin, lightweight, and compact. They are typically of rectangular forms with rounded corners and exhibit sensorial qualities that are light, clean, smooth, and cool.

Forms



Box



Rounded Box



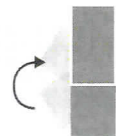
Tall



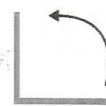
Wide



Slide



Flip



Book

Instances



Laptop



Netbook



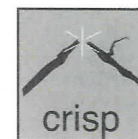
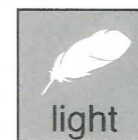
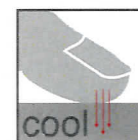
PDA

Screen Objects: Laptop: HP Pavillion dv4t

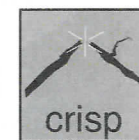
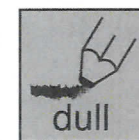
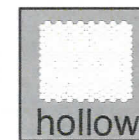


Material Properties

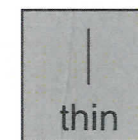
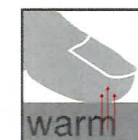
Sight



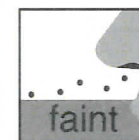
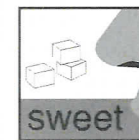
Sound



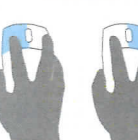
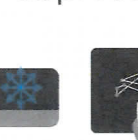
Feel



Smell



Movement

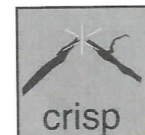
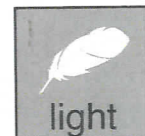
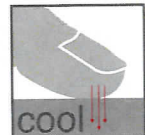


Screen Objects: Netbook: Intel Mobile Micro

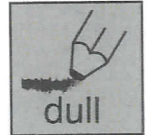
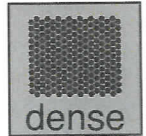


Material Properties

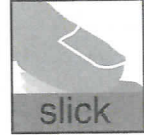
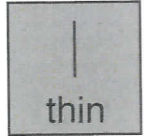
Sight



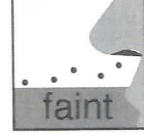
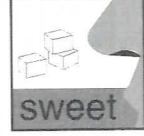
Sound



Feel



Smell



Movement

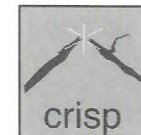
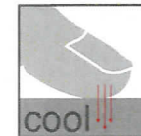


Screen Objects: PDA: iPhone 3G

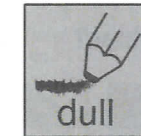
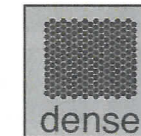


Material Properties

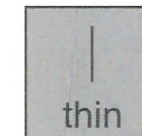
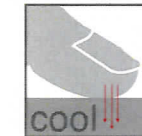
Sight



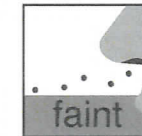
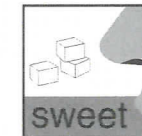
Sound



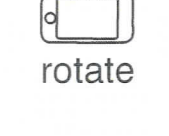
Feel



Smell





















Movement



Material Analysis: Screen Objects













Vision Adjectives

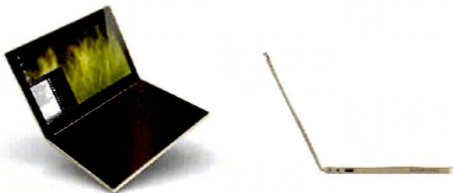
Laptop	 smooth	 cool	 shiny	 light	 crisp	 bright
Netbook	 smooth	 cool	 shiny	 light	 crisp	 bright
PDA	 smooth	 cool	 shiny	 light	 crisp	 bright



HP Pavillion dv4t
















Acoustic Adjectives

Laptop	 hollow	 dull	 tinny	 crisp	 fuzzy
Netbook	 dense	 dull	 thick		 fuzzy
PDA	 dense	 dull	 thick		













Intel Mobile Metro

Tactile Adjectives

Laptop	 smooth	 warm	 thin	 hard	 slick
Netbook	 smooth	 cool	 thin	 hard	 slick
PDA	 smooth	 cool	 thin	 hard	 slick

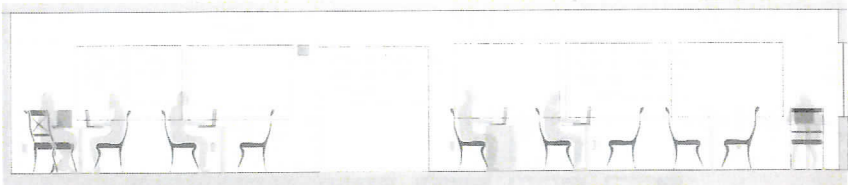
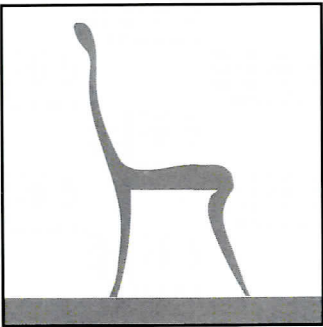
Smell Adjectives

Laptop	 sweet	 faint	 Fe iron	 fuzzy
Netbook	 sweet	 faint	 Fe iron	
PDA	 sweet	 faint	 Fe	



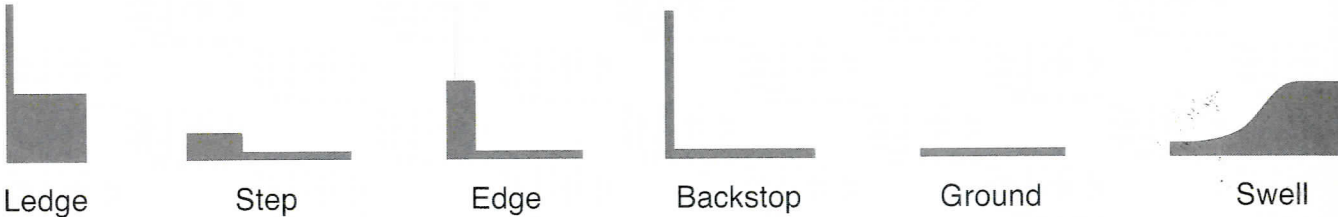
iPhone 3G

2 Objects of Reprieve: Seating

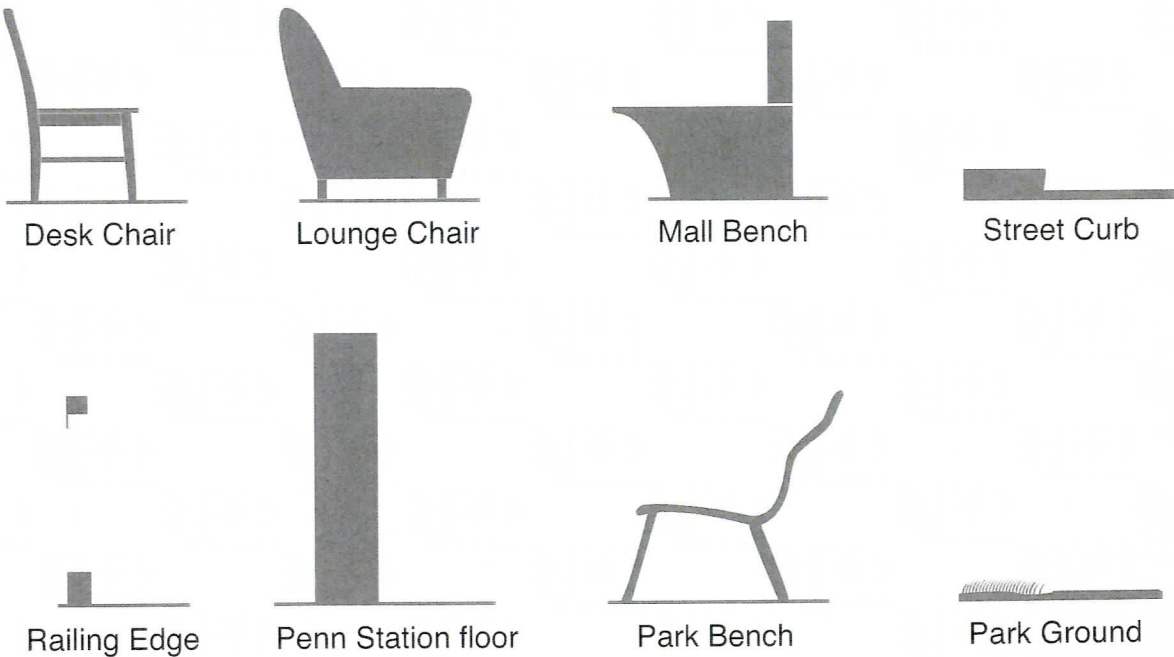


Objects of reprieve such as seats offer a spatial stability. They can delineate a personal space and enable a moment of pause. They commonly incited transitions from non-place to screenplace but were not commonly sought out by those happening upon the screenspace.

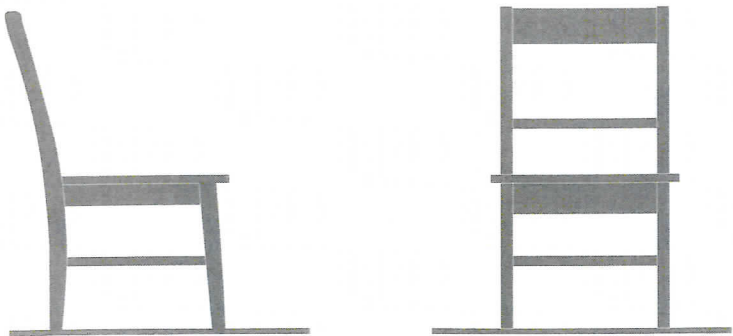
Forms



Instances



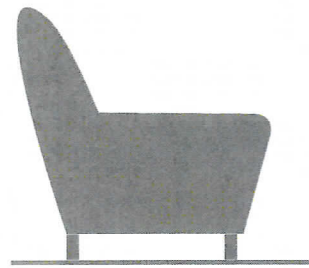
Instance Analysis: Seating: Desk Chair



Material Properties

Sight	Sound	Feel	Smell	Movement
 smooth	 dense	 slick	 light	
 soft	 heavy	 cool	 sweet	
 shiny	 hard	 hard	 woody	
 bright	 dry	 light	 crisp	
 light				
 light				 plan

Instance Analysis: Seating: Lounge Chair



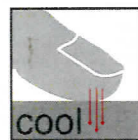
Material:



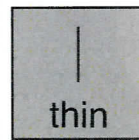
velour

Material Properties

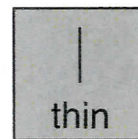
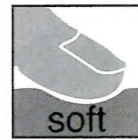
Sight



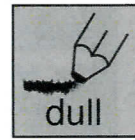
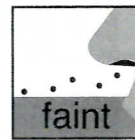
Sound



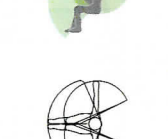
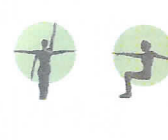
Feel



Smell

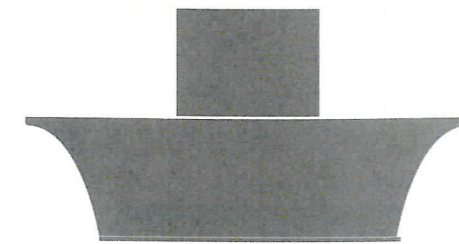
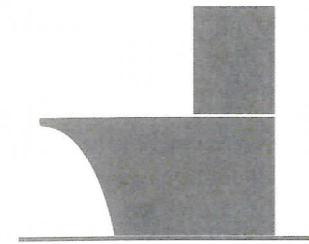


Movement



plan

Instance Analysis: Seating: Mall Bench



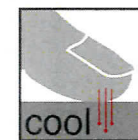
Material:



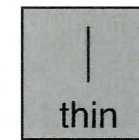
plastic

Material Properties

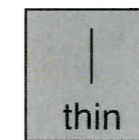
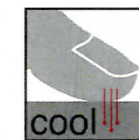
Sight



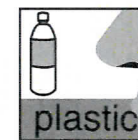
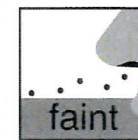
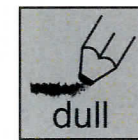
Sound



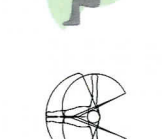
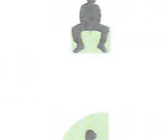
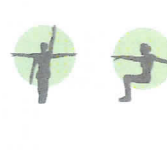
Feel



Smell



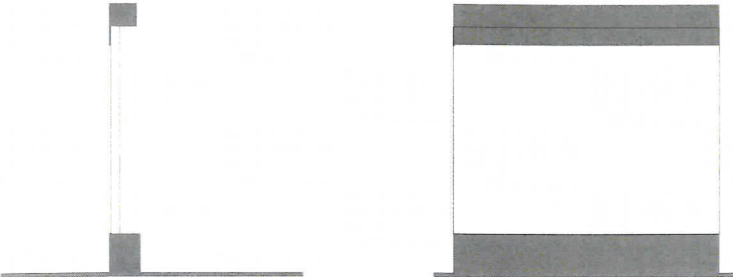
Movement



plan

Instance Analysis: Seating: Curb

Instance Analysis: Seating: Railing



Material:



concrete

Material:



metal



glass

Material Properties

Material Properties

Sight

Sound

Feel

Smell

Movement

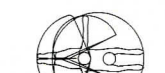
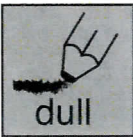
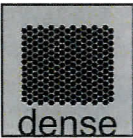
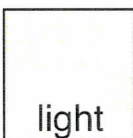
Sight

Sound

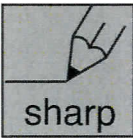
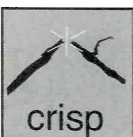
Feel

Smell

Movement

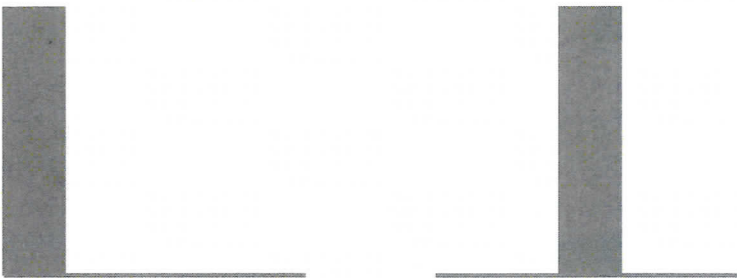


plan



plan

Instance Analysis: Seating: Linoleum Floor



Material:



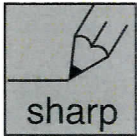
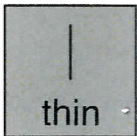
linoleum

Material Properties

Sight



Sound



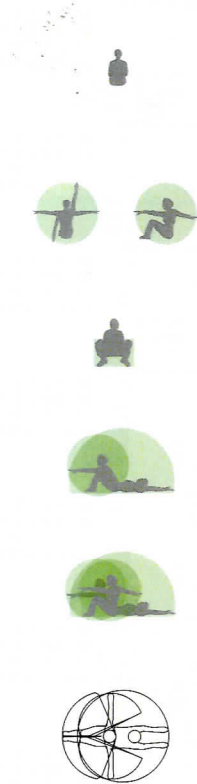
Feel



Smell

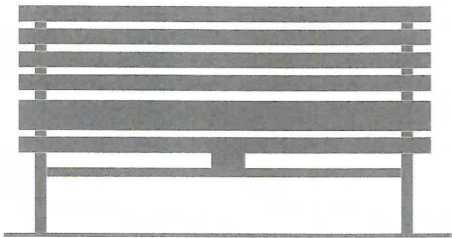
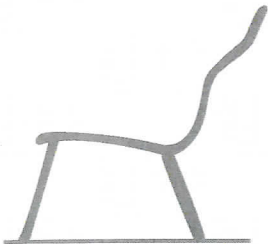


Movement

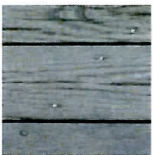


plan

Instance Analysis: Seating: Bench



Material:



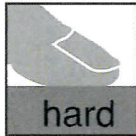
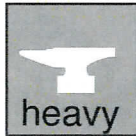
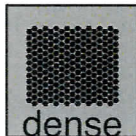
wood

Material Properties

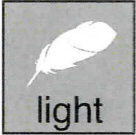
Sight



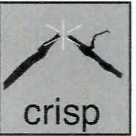
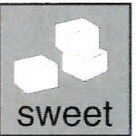
Sound



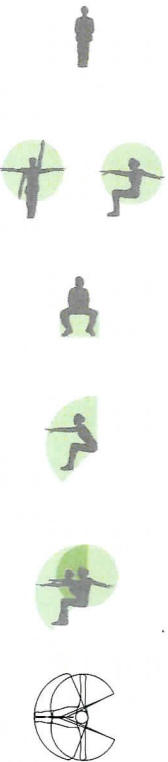
Feel



Smell



Movement



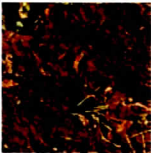
plan

Instance Analysis: Seating: Grassy Ground

Material:



grass



dirt



Material Properties

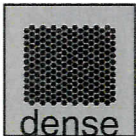
Sight



soft



rough



dense



cool



shiny

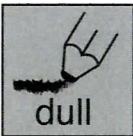
Sound



dry



soft

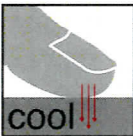


dull



fuzzy

Feel



cool



rough

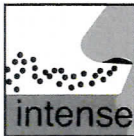


bumpy

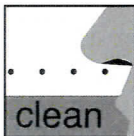


sharp

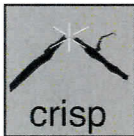
Smell



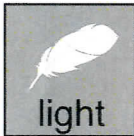
intense



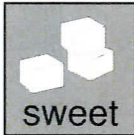
clean



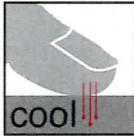
crisp



light

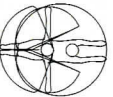


sweet



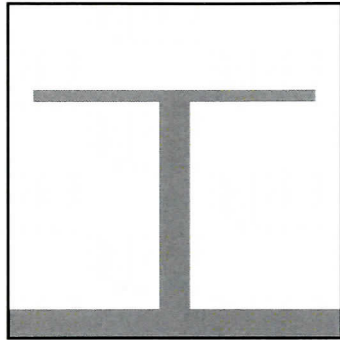
cool

Movement



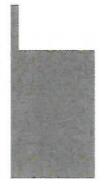
plan

3 Objects of Reprieve: Leaning

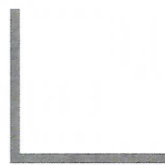


Similar to seating, stable surfaces became loci of screenplace transitions. They were sometimes used premeditatively by those with laptops but more opportunely incorporated by those unexpectedly entering into screenspace via PDAs and phones.

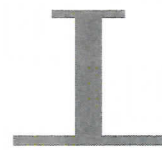
Forms



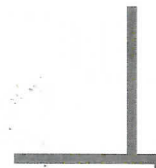
Ledge



Backstop

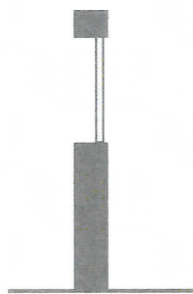


T

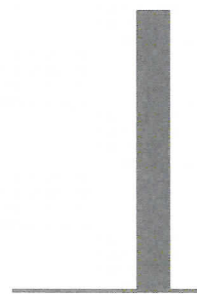


Railing

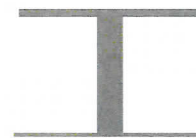
Instances



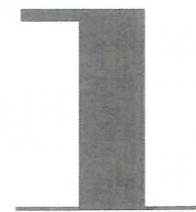
Window Sill



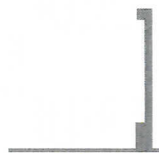
Wall



Table



Counter

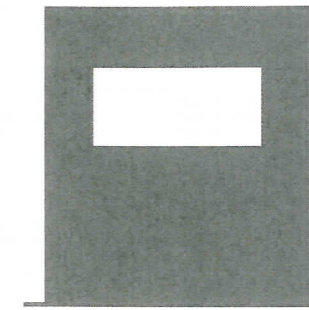
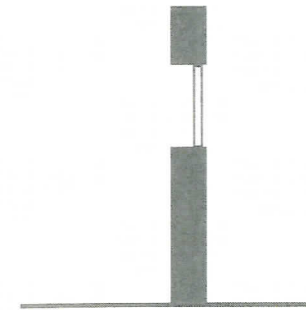


Railing

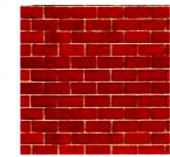


Fence

Instance Analysis: Leaning: Window Sill



Material:



brick

Material Properties

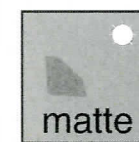
Sight



rough



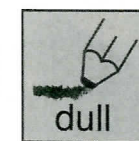
hard



matte



dry

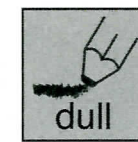


dull

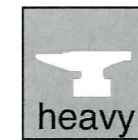


heavy

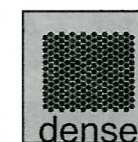
Sound



dull



heavy



dense

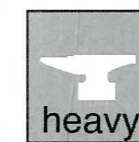
Feel



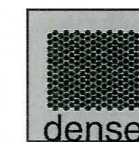
rough



hard



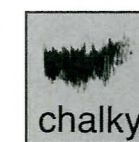
heavy



dense



dry



chalky

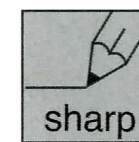
Smell



musty



chalky



sharp

Fe
iron

Movement



Instance Analysis: Leaning: Window Sill



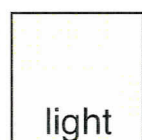
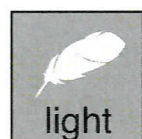
Material:



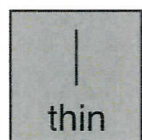
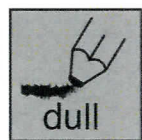
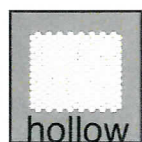
painted
plasterboard

Material Properties

Sight



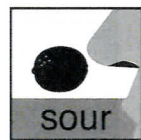
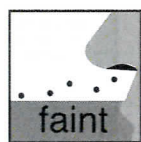
Sound



Feel



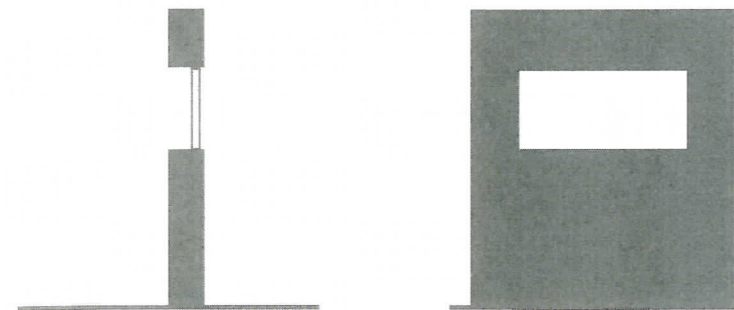
Smell



Movement



Instance Analysis: Leaning: Window Sill



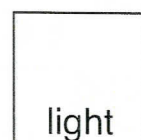
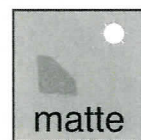
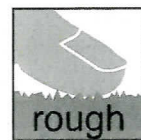
Material:



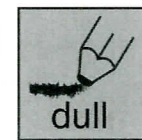
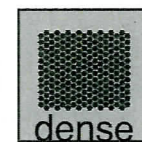
concrete

Material Properties

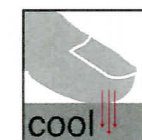
Sight



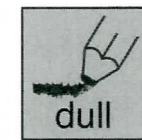
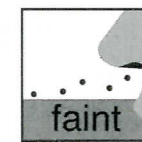
Sound



Feel



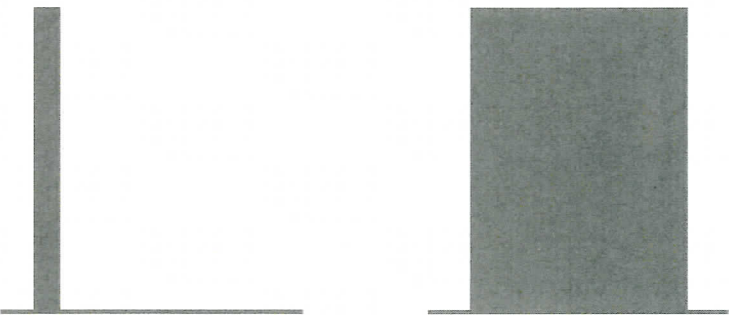
Smell



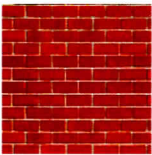
Movement



Instance Analysis: Leaning: Wall

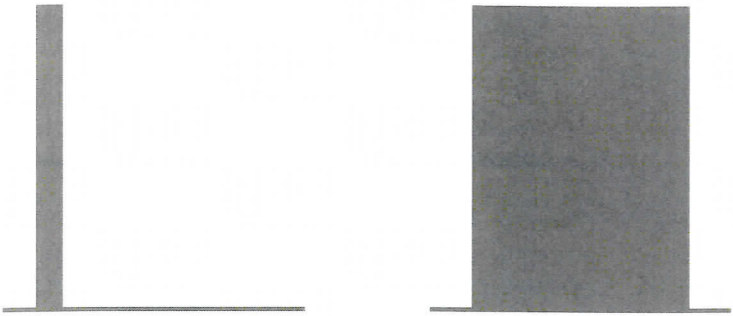


Material:



brick

Instance Analysis: Leaning: Wall



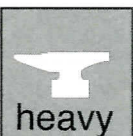
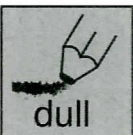
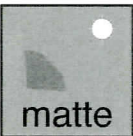
Material:



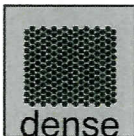
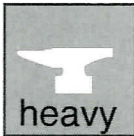
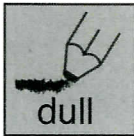
painted
plasterboard

Material Properties

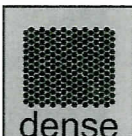
Sight



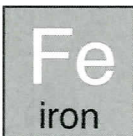
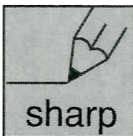
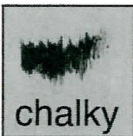
Sound



Feel



Smell

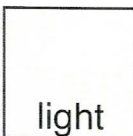


Movement

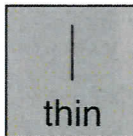
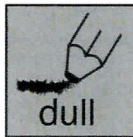
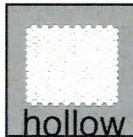


Material Properties

Sight



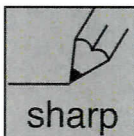
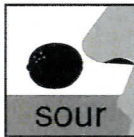
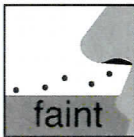
Sound



Feel



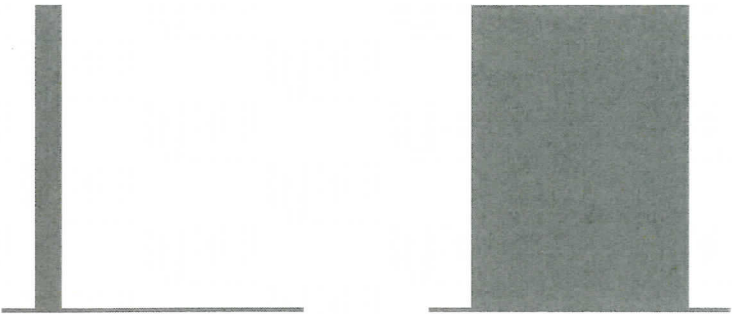
Smell



Movement



Instance Analysis: Leaning: Wall



Material:



concrete

Material Properties

Sight



bumpy



rough



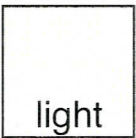
matte



heavy

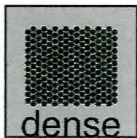


hard

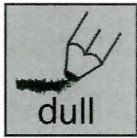


light

Sound



dense



dull

Feel



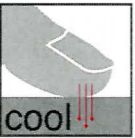
bumpy



rough



dry

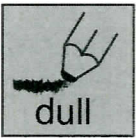


cool

Smell



faint



dull

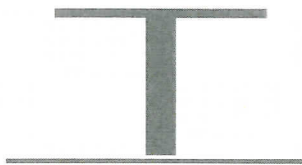
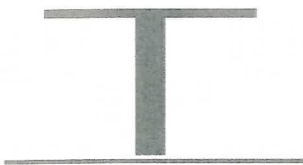


chalky

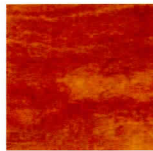
Movement



Instance Analysis: Leaning: Table



Material:



finished wood

Material Properties

Sight



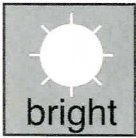
smooth



soft



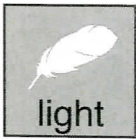
shiny



bright

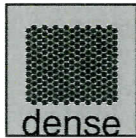


light

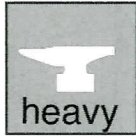


light

Sound



dense



heavy



hard



dry

Feel



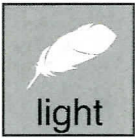
slick



cool

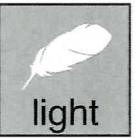


hard

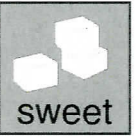


light

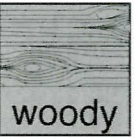
Smell



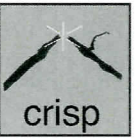
light



sweet



woody



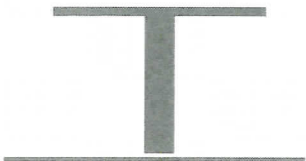
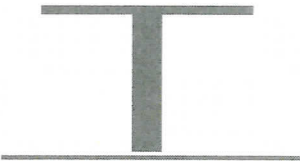
crisp

Movement

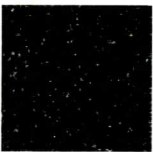


Instance Analysis: Leaning: Table

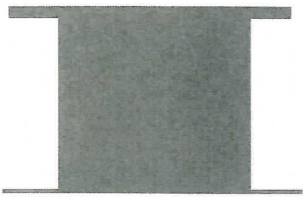
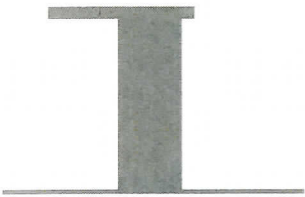
Instance Analysis: Leaning: Counter



Material:



plastic laminate



Material:



plastic laminate

Material Properties

Material Properties

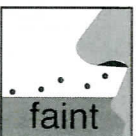
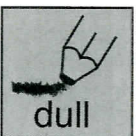
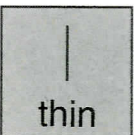
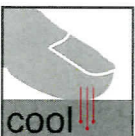
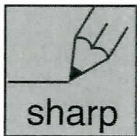
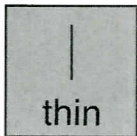
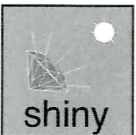
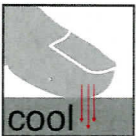
Sight

Sound

Feel

Smell

Movement



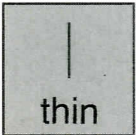
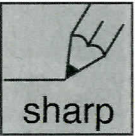
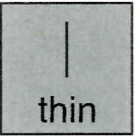
Sight

Sound

Feel

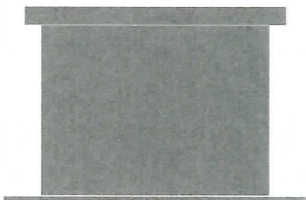
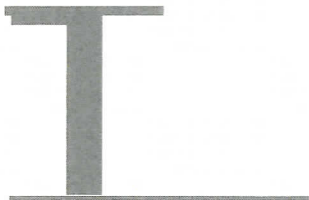
Smell

Movement

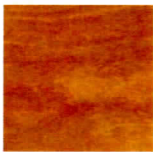


Instance Analysis: Leaning: Counter

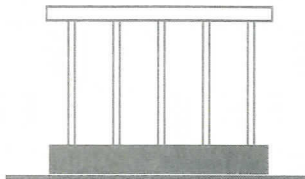
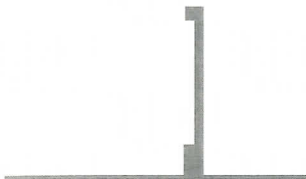
Instance Analysis: Leaning: Railing



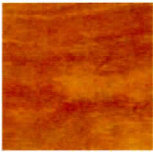
Material:



finished wood



Material:



finished wood

Material Properties

Material Properties

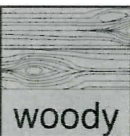
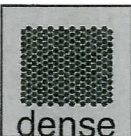
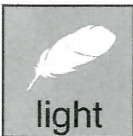
Sight

Sound

Feel

Smell

Movement



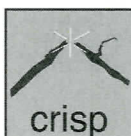
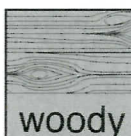
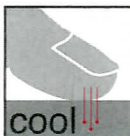
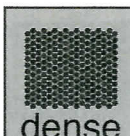
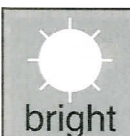
Sight

Sound

Feel

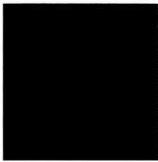
Smell

Movement


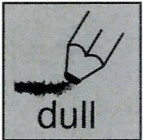



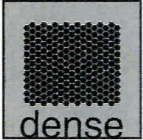



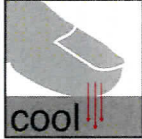
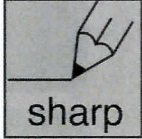
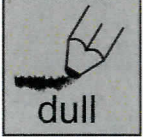
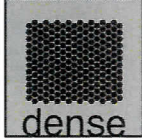




Instance Analysis: Leaning: Railing





Material:  cast iron

Material Properties



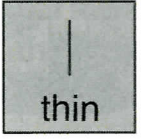

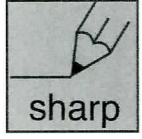


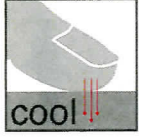
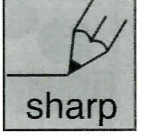
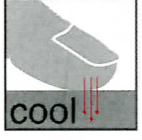





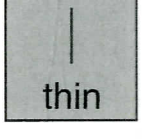
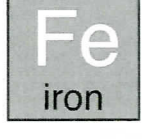

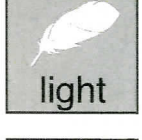


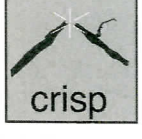
Sight	Sound	Feel	Smell
 rough	 dull	 rough	 bitter
 hard	 dense	 hard	 sour
 matte		 cool	 sharp
 dull		 dense	 Fe iron
 light			

Instance Analysis: Leaning: Railing

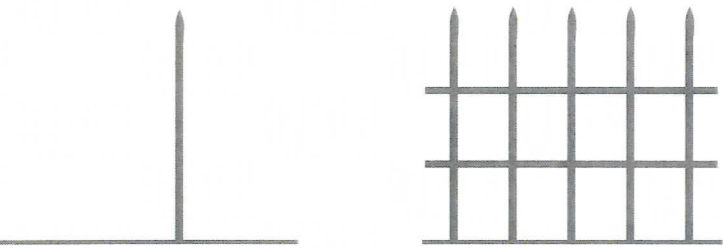


Material:  brushed metal  glass

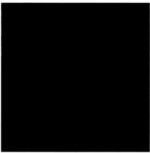
Material Properties

Movement	Sight	Sound	Feel	Smell	Movement
	 smooth	 thin	 smooth	 sharp	
	 cool	 sharp	 cool	 faint	
	 shiny	 tinny	 thin	 Fe iron	
	 light		 hard		
	 crisp				

Instance Analysis: Leaning: Fence



Material:



cast iron

Material Properties



rough



dull



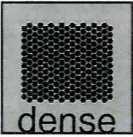
rough



bitter



hard



dense



hard



sour



matte



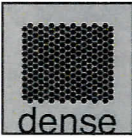
cool



sharp



dull



dense



light



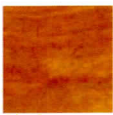
Fe
iron

Movement

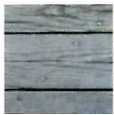


In order to digest the qualities of the appropriated objects, the accumulated qualities have been gathered together by sensation regardless of the specific material which provoked the sensation. This will help emphasize the uniformity or diversity of effects rather than the uniformity or diversity of the materials themselves.


Material Analysis: Seating: Vision




finished wood




wood




concrete




linoleum




velour




plastic



brushed metal



grass




glass

The objects appropriated for sitting are most commonly smooth, cool and shiny to the eye, much like the peripheral device on which they engage the screen. Visual qualities are often understood as tactile properties in a sensorial synesthesia

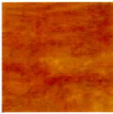
Visual Adjectives


Material Analysis: Leaning: Vision




painted plasterboard




finished wood




concrete




cast iron



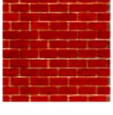
plastic laminate




plastic laminate



brushed metal



brick



glass

The objects appropriated for leaning don't suggest any significant tendency for a particular visual quality.

Visual Adjectives

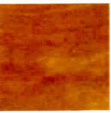
								
								
								
								
								
								
								
								
								
								
								
								
								
								

Material Analysis: Seating: Sound


Material Analysis: Leaning: Sound

Acoustic Adjectives


Acoustic Adjectives




finished wood




wood




concrete



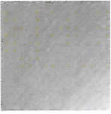
linoleum




velour




plastic



brushed metal




grass



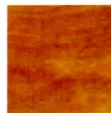
glass

thin	thin	thin	thin	thin					
dense	dense	dense							
sharp	sharp	sharp	sharp						
dull	dull								
dry	dry	dry							
heavy	heavy								
tinny									
fuzzy	fuzzy								
hard	hard								
smooth									
soft									


The acoustic qualities of the seated screenplace tend towards a thin, clean sharp quality characteristic of metals, glass, and polished surfaces. The sound an object makes in common interaction suggests often suggests physical properties such as depth, density, and textures in yet another overlay of sensorial information and expectation.




painted plasterboard




finished wood




concrete




cast iron



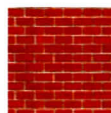
plastic laminate




plastic laminate



brushed metal



brick

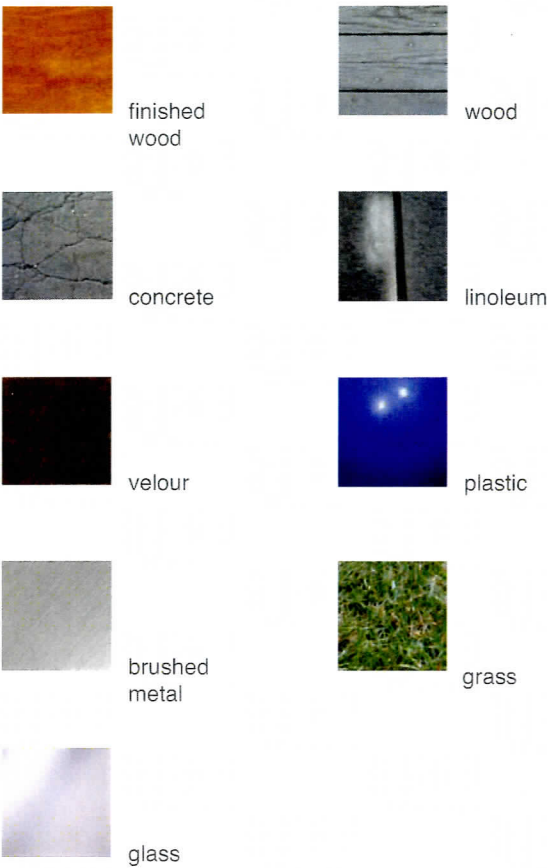


glass

					thin	thin	thin	thin	
					dense	dense	dense	dense	
					dull	dull	dull	dull	
					sharp	sharp	sharp		
								dry	
							heavy	heavy	
								tinny	
								hard	

The objects appropriated for leaning tend to have acoustical qualities that result in dull "thuds". There is however an acoustic division between the backstop condition which tended to be structural elements versus the tinny, thin, and sharp sounds of the railings.

Material Analysis: Seating: Feel

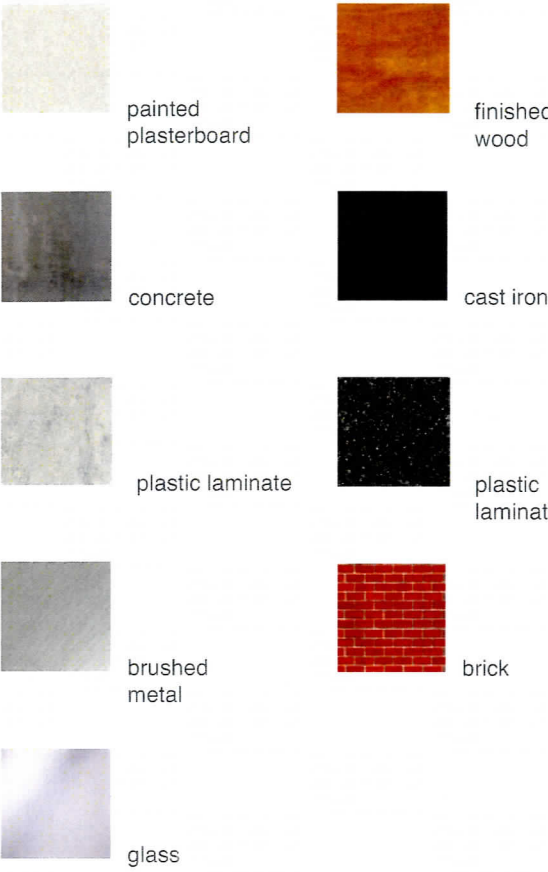


Tactile Adjectives



The feel of the seats echoes that of its visual qualities and likewise has close correlations with the tactile properties of the cell phone, laptop, and television.

Material Analysis: Leaning: Feel



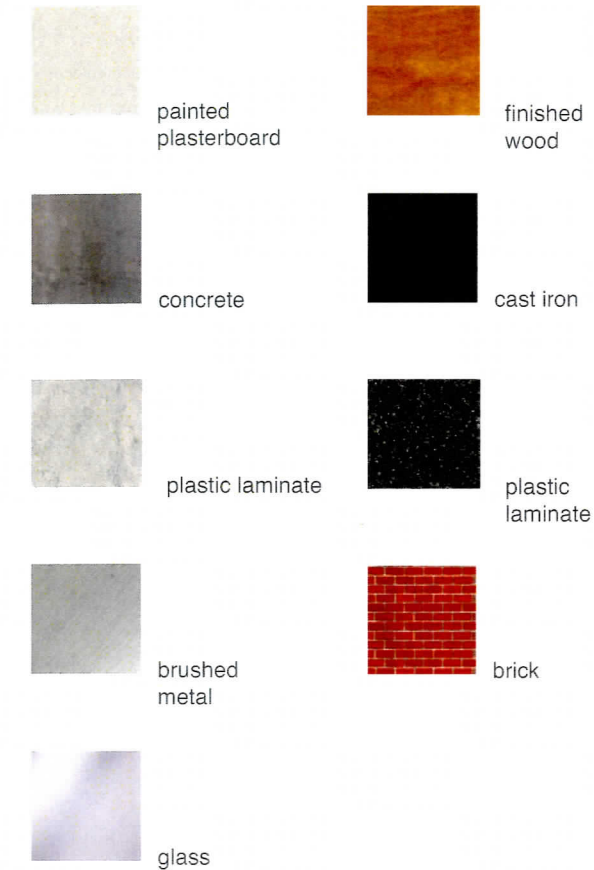
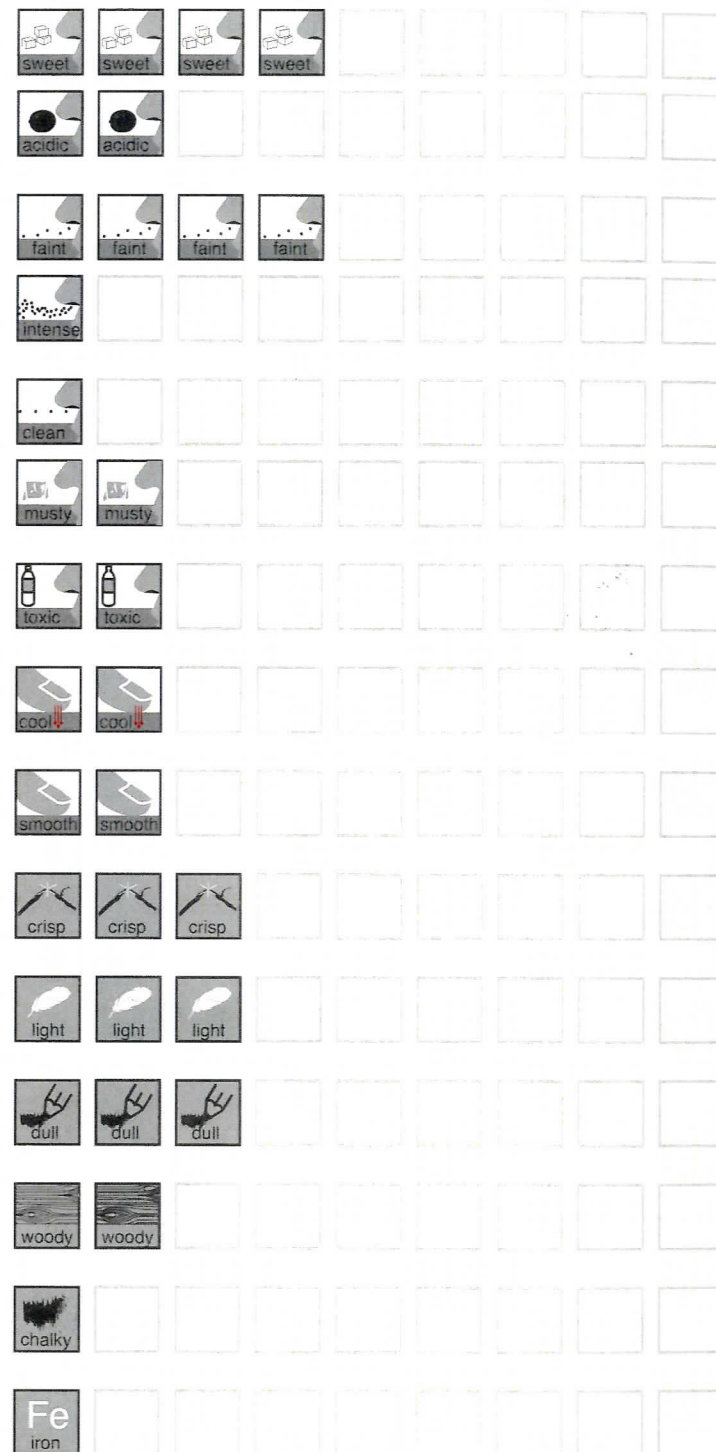
Tactile Adjectives



The objects appropriated for leaning tend to be split once again between the railings and the non-structural and structural elements. Yet we do see a consistent tactile rigidity and coolness characteristic of polished or painted stone, metal and plastic.

Material Analysis: Leaning: Smell

Smell Adjectives



Although contemporary manufacturing is focused on reducing odorants there remains an array of subtle olfactory experiences. The acidic and toxic smell of plastic and finishes, the crisp clean smell of metal and glass and the sweet smell of wood and varnishes suggest opportunities for a subtle engagement of the objects within the screenplace.

Delineating the Peripheral: Posture Design

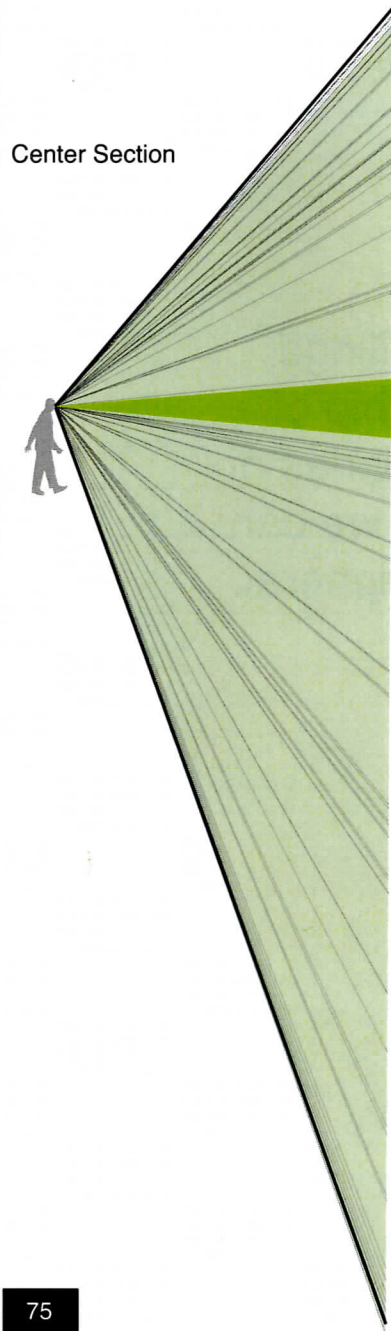
Objects such as chairs, tables, and railings frame postures in space, the relationship of the screen to the body, and the boundaries of the peripheral. Through object design we can begin to design the location of the peripheral.

Peripheral Limits: Vision

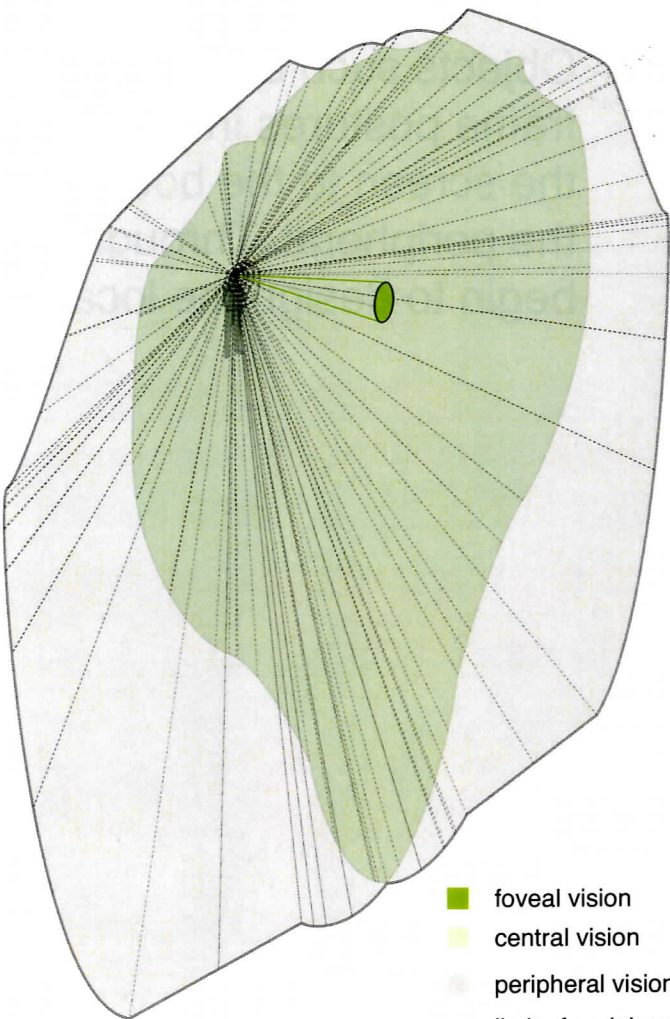
Our peripheral experience is characterized by movement and contrast within the black and white spectrum, 30° off center vision.

Peripheral Vision encloses us. It is conventionally defined as the area of reception 30 degrees off-center where the number of our rods and cones precipitously drops. In our peripheral vision we remain responsive to motion and contrast in a black and white spectrum.

Center Section

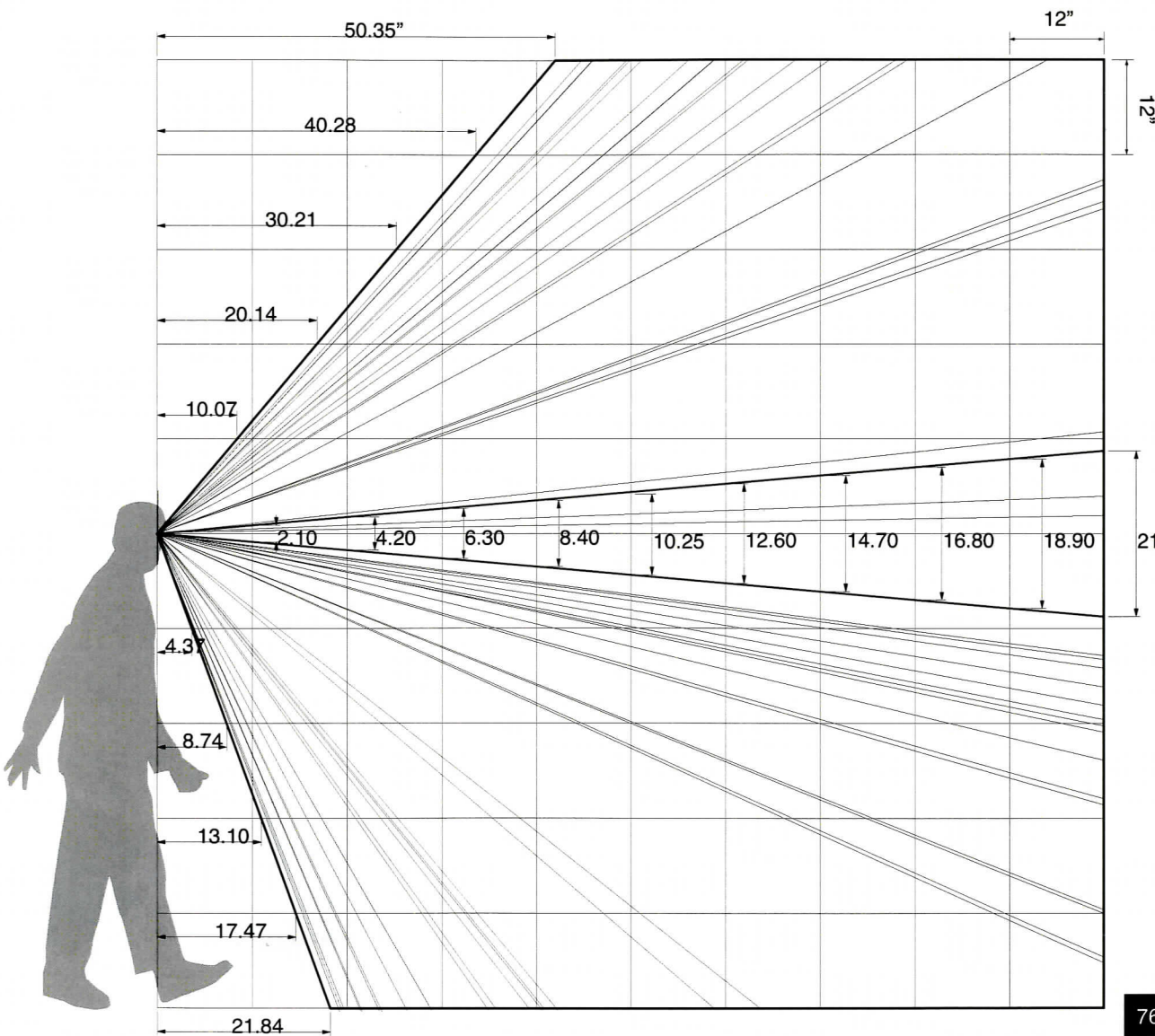
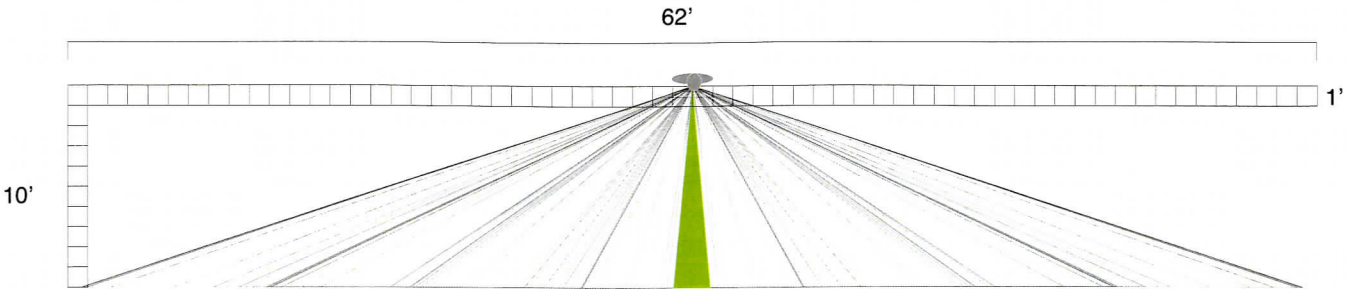


Perspective



- foveal vision
- central vision
- peripheral vision
- limit of peripheral vision

Peripheral Architecture



Peripheral Limits: Sound

Peripheral Sound lies between the direct and the masked experience.

It is a range determined by attenuation and absorption.

Attenuation:
Attenuation the gradual depreciation of the pressure wave caused by air humidity, pressure, and distance.

Absorption:
Absorption is caused by the interaction of a sound wave with a surface. Surfaces have the ability to absorb a range of energy. Marble and other hard smooth surfaces absorb minimal energy from sound waves thus enabling the echo.

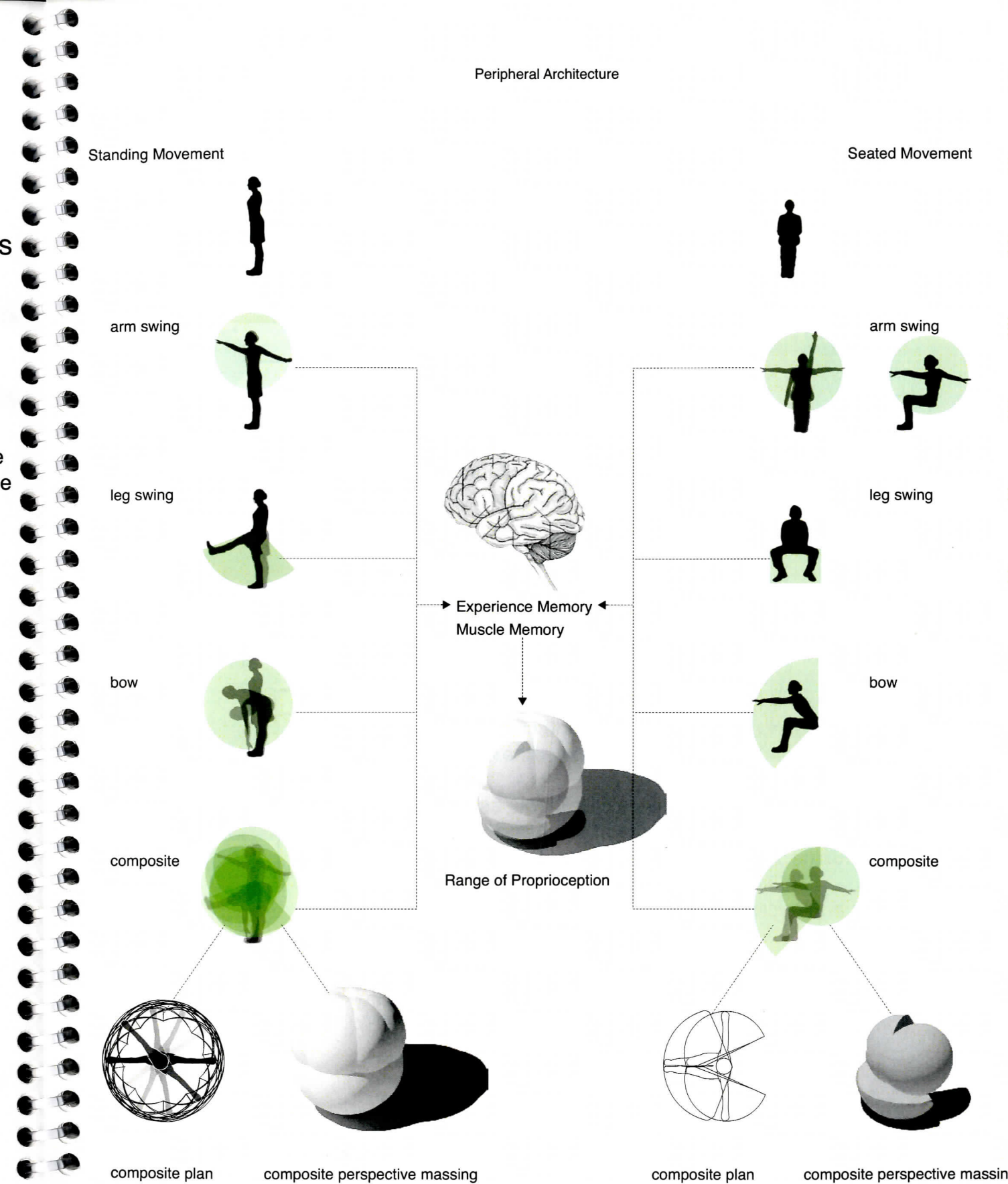
Direct
Useful
Reverb
Masked

Peripheral Limits: Touch

The periphery of tactility is the range of tactile experience within the limits of our movement, mapped and catalogued by proprioception.

The sense of touch is an interpretation of our body's deformation and the most spatially intimate of all our senses. Yet our capacity to experience a sensation diminishes over if the same electrical signal is continually fired. Thus it is change which we are most adept in sensing, change caused by the movement of our body and its interaction with new stimuli.

Thus, as we occupy a place and move within it the more diverse the stimuli the more tactually engaged we are apt to become.



Peripheral Limits: Smell

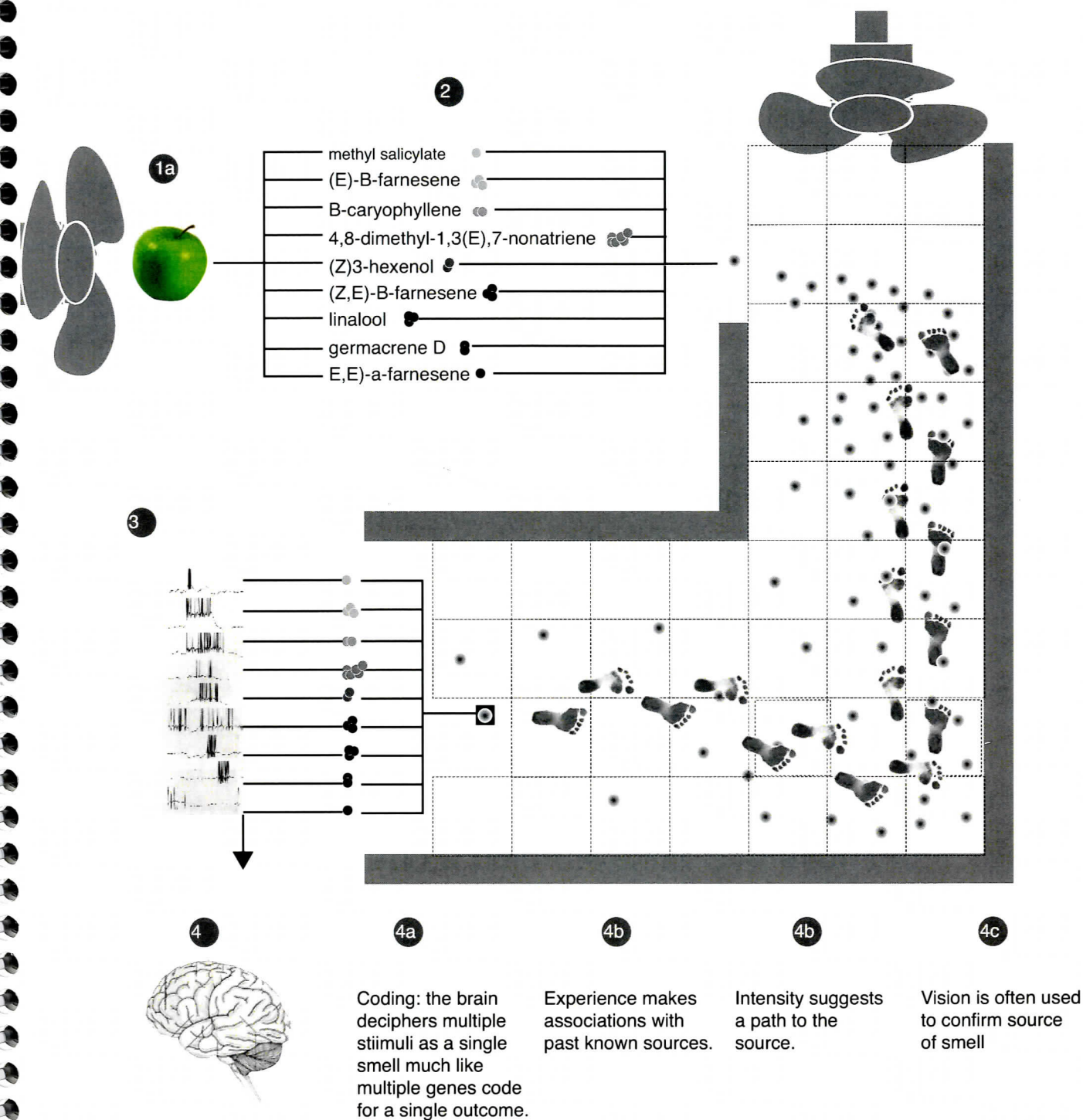
Peripheral smells are those smells passively engaged through changing airflows or odorants.

The smell of a thing is perceived by an interaction with a chemical particulate and the olfactory bulb of our nose. These particulates radiate from their source as the molecules collide. Eventually, after thinning out, the density of the molecules will not be enough to trigger our sensation of them. This is called the threshold potential.

Different odorants have different threshold potentials, and different substances are composed of different odorants. For instance, the smell of an apple is composed of at least nine perceptible odorants.

What is perceived then as the scent of an apple is actually a complex code received from the chemical receptors of the nose and comprehended as "the smell of an apple."

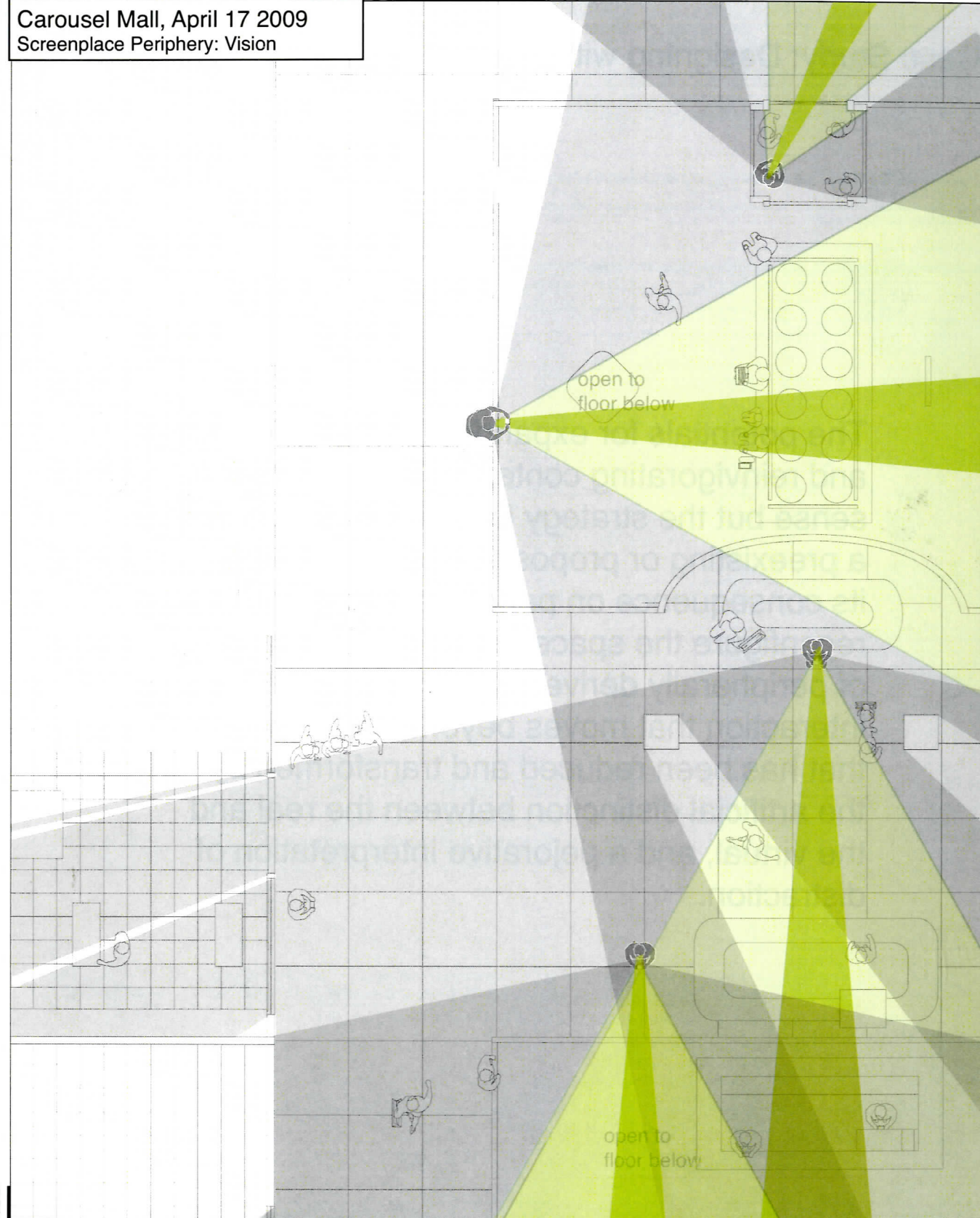
Of course, experience plays a crucial role as we navigate space to find the source of smell and by seeking out the source we reinforce associations of perceived spatial relations based on architectural conventions and odorant intensities.



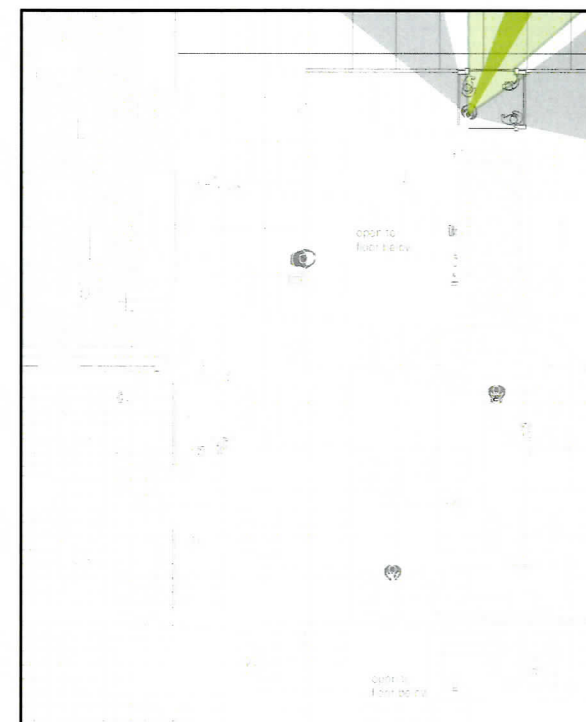
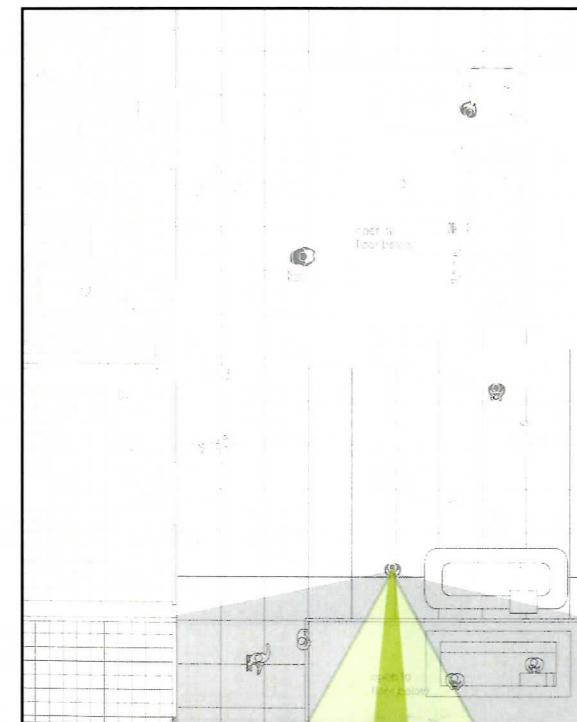
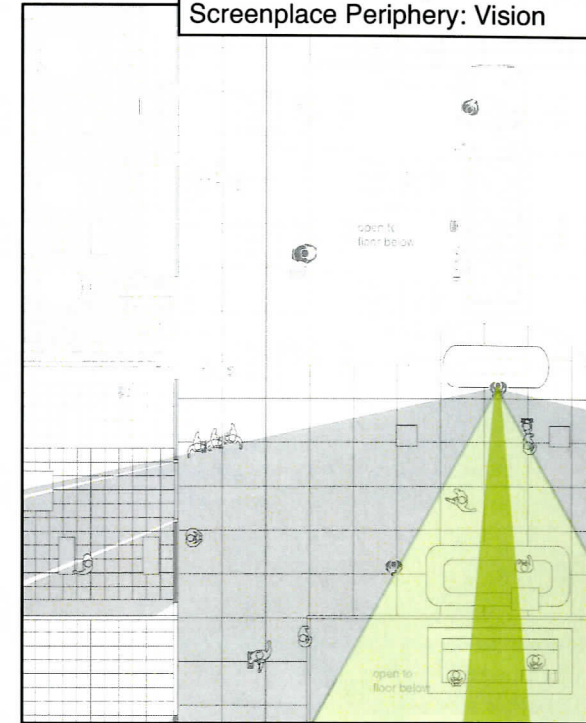
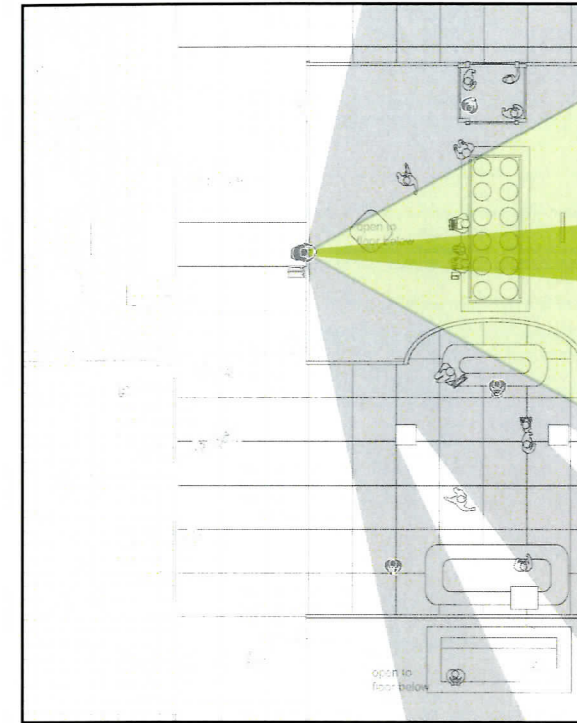
Case Study: Designing with Peripheral Vision

The potentials for expanding the screenplace and reinvigorating context is unique to each sense but the strategy is systemic: begin with a preexisting or proposed posture, identify its consequence on peripheral limits and reconfigure the space to enable an expansion of peripherally derived information and interaction that moves beyond an architecture that has been reduced and transformed by the artificial distinction between the real and the virtual, and a pejorative interpretation of distraction.

Carousel Mall, April 17 2009
Screenplace Periphery: Vision



Carousel Mall, April 17 2009
Screenplace Periphery: Vision

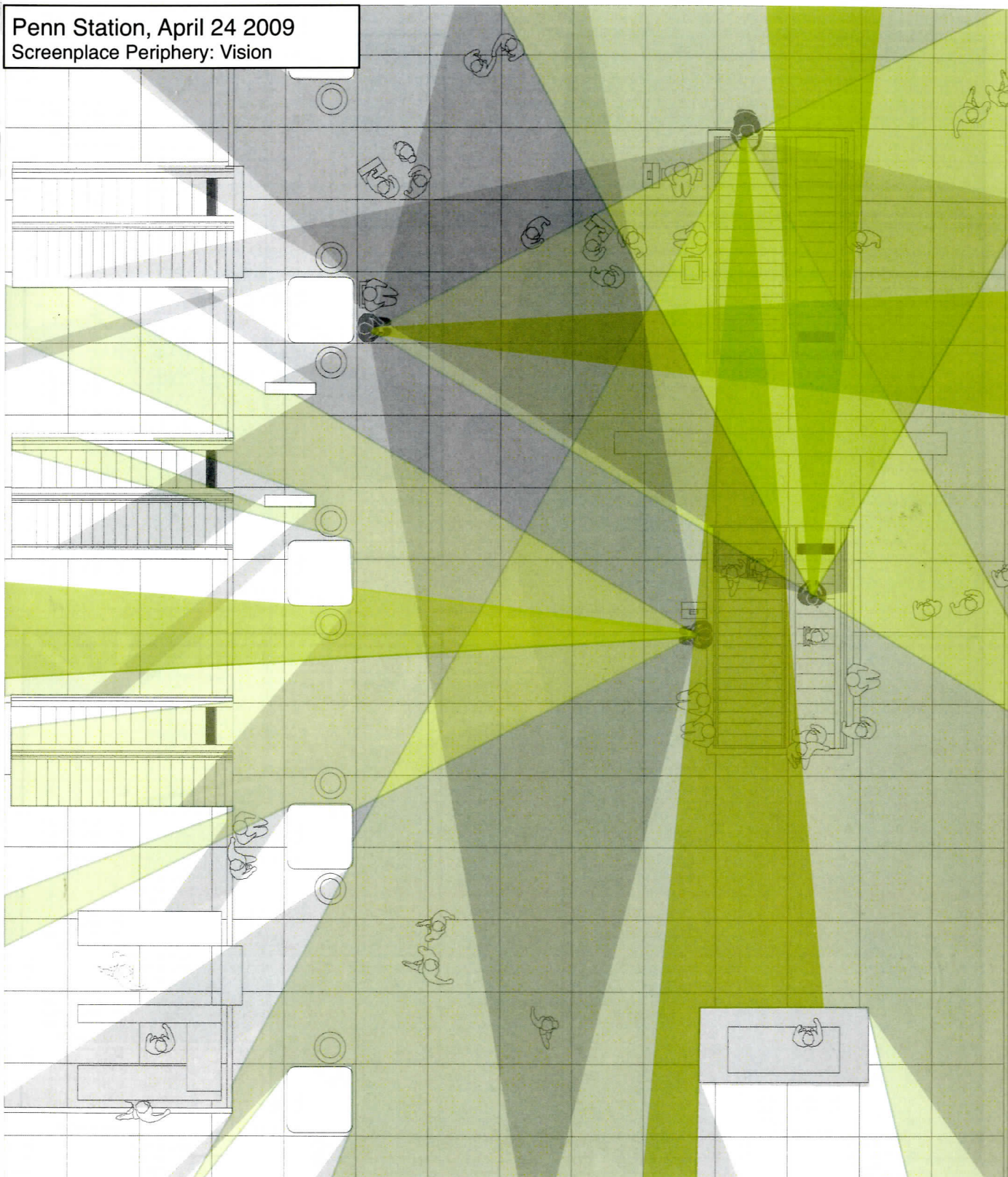


central vision

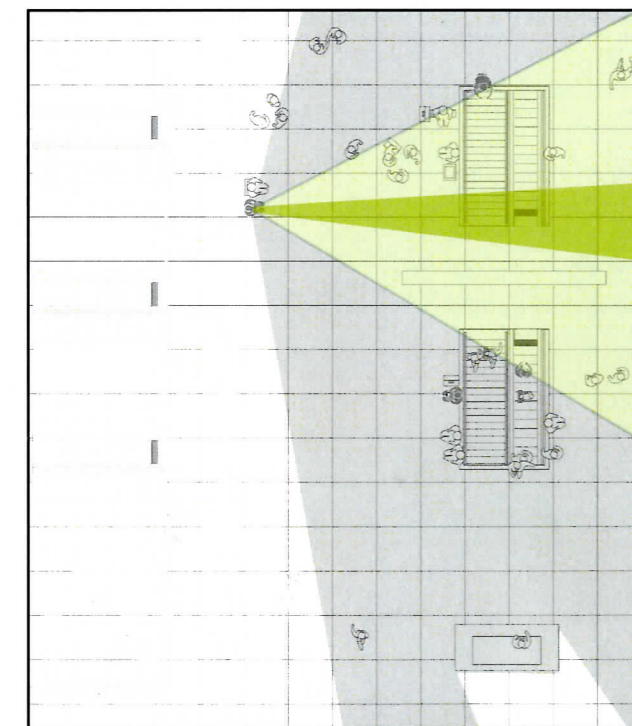
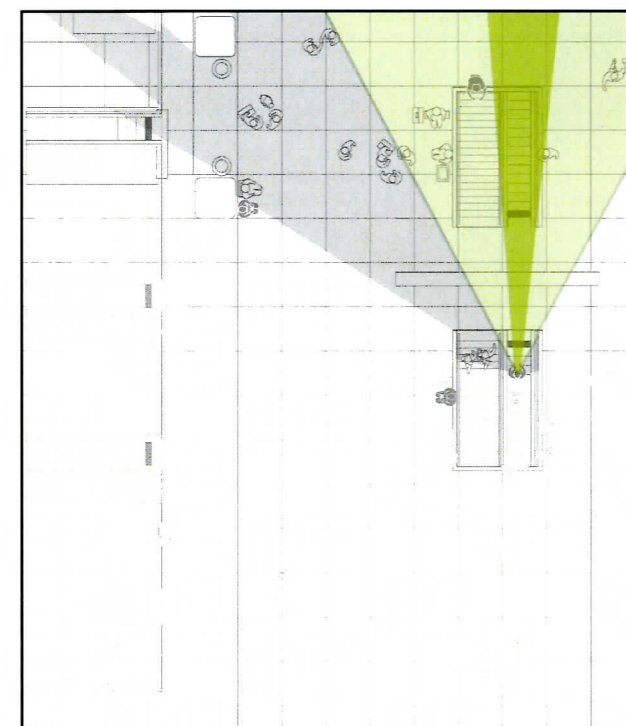
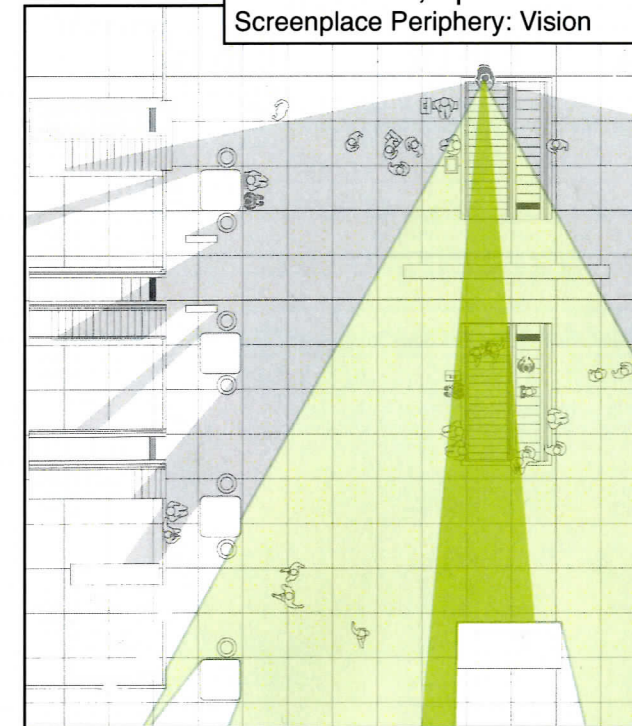
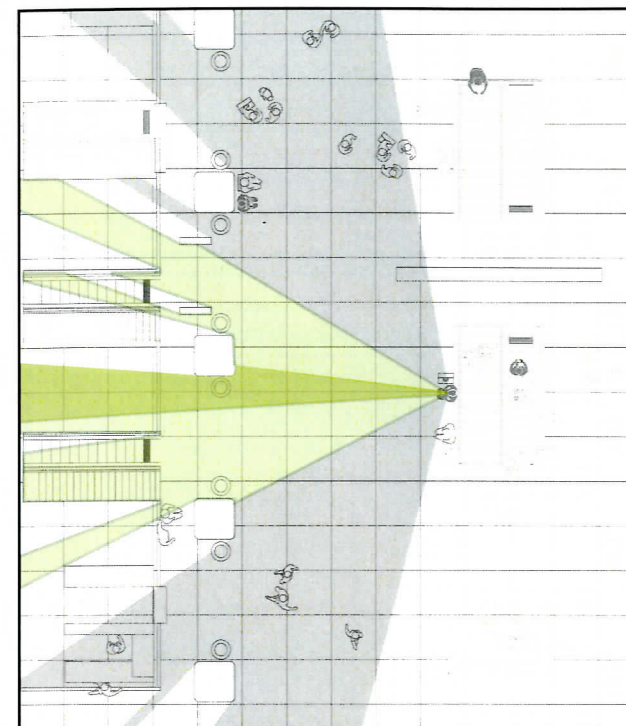
foveal vision

peripheral

Penn Station, April 24 2009
Screenplace Periphery: Vision



Penn Station, April 24 2009
Screenplace Periphery: Vision

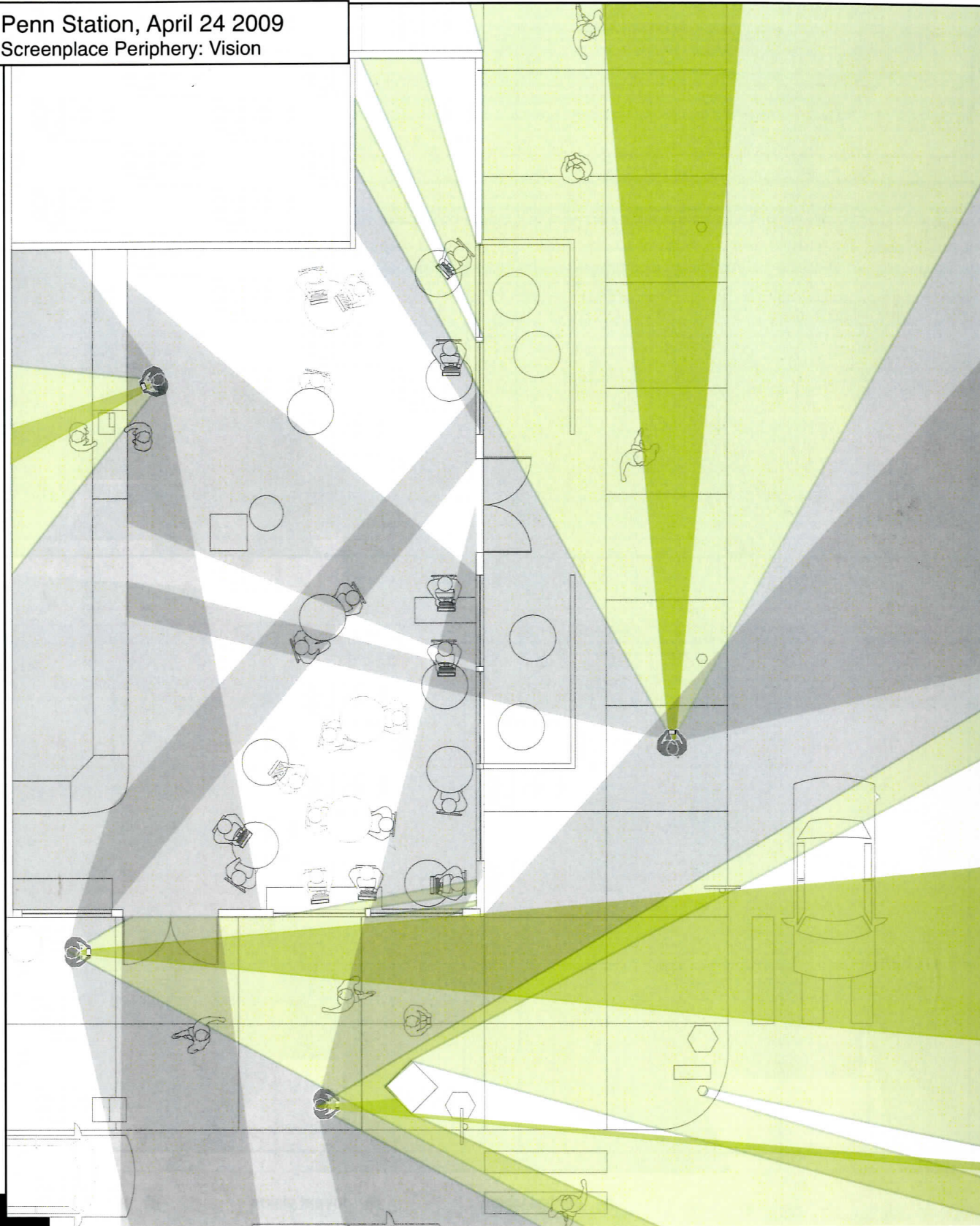


central vision

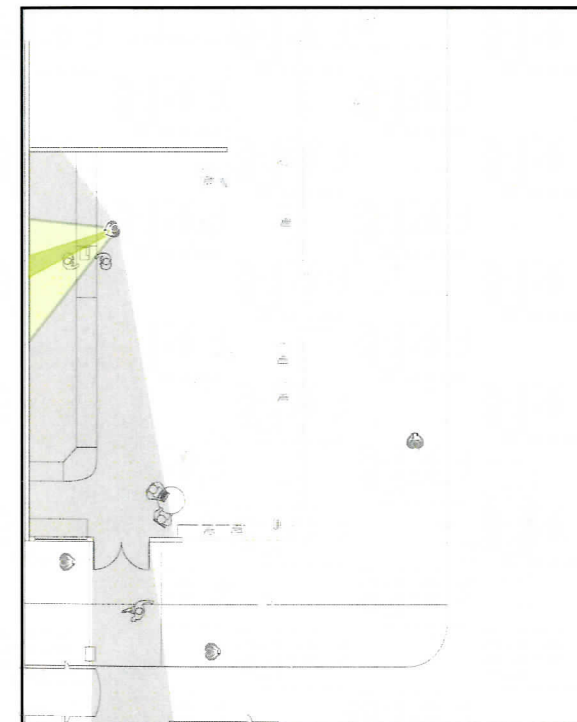
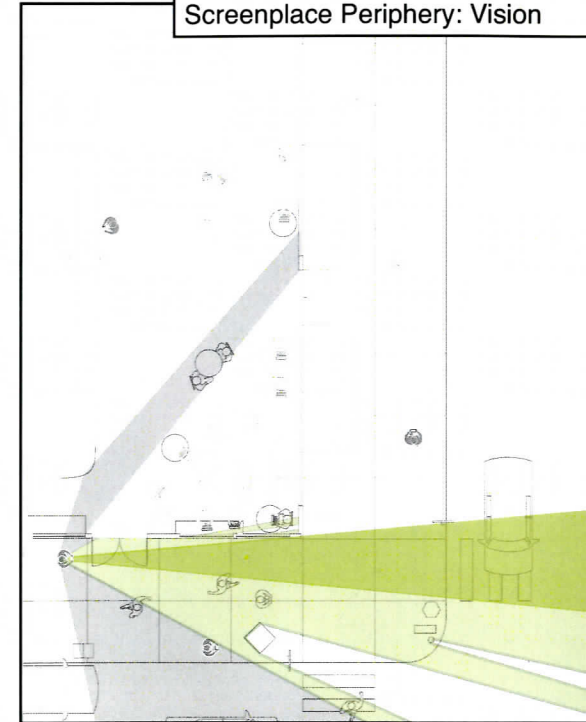
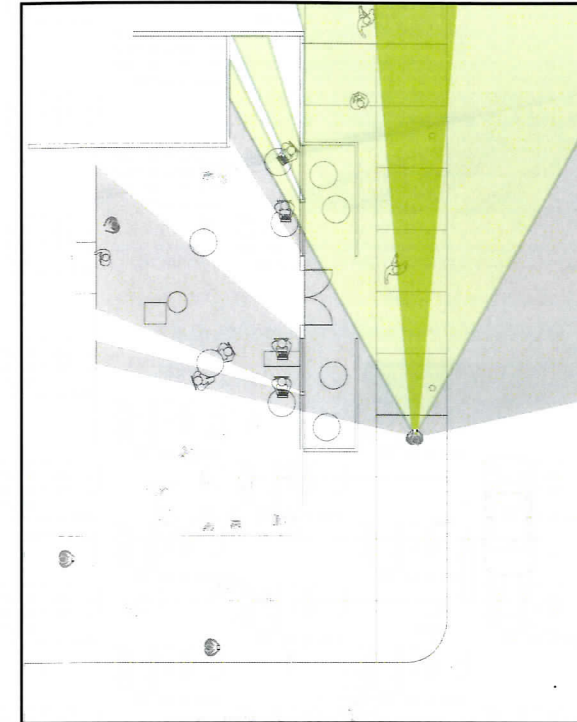
foveal vision

peripheral

Penn Station, April 24 2009
Screenplace Periphery: Vision



Penn Station, April 24 2009
Screenplace Periphery: Vision

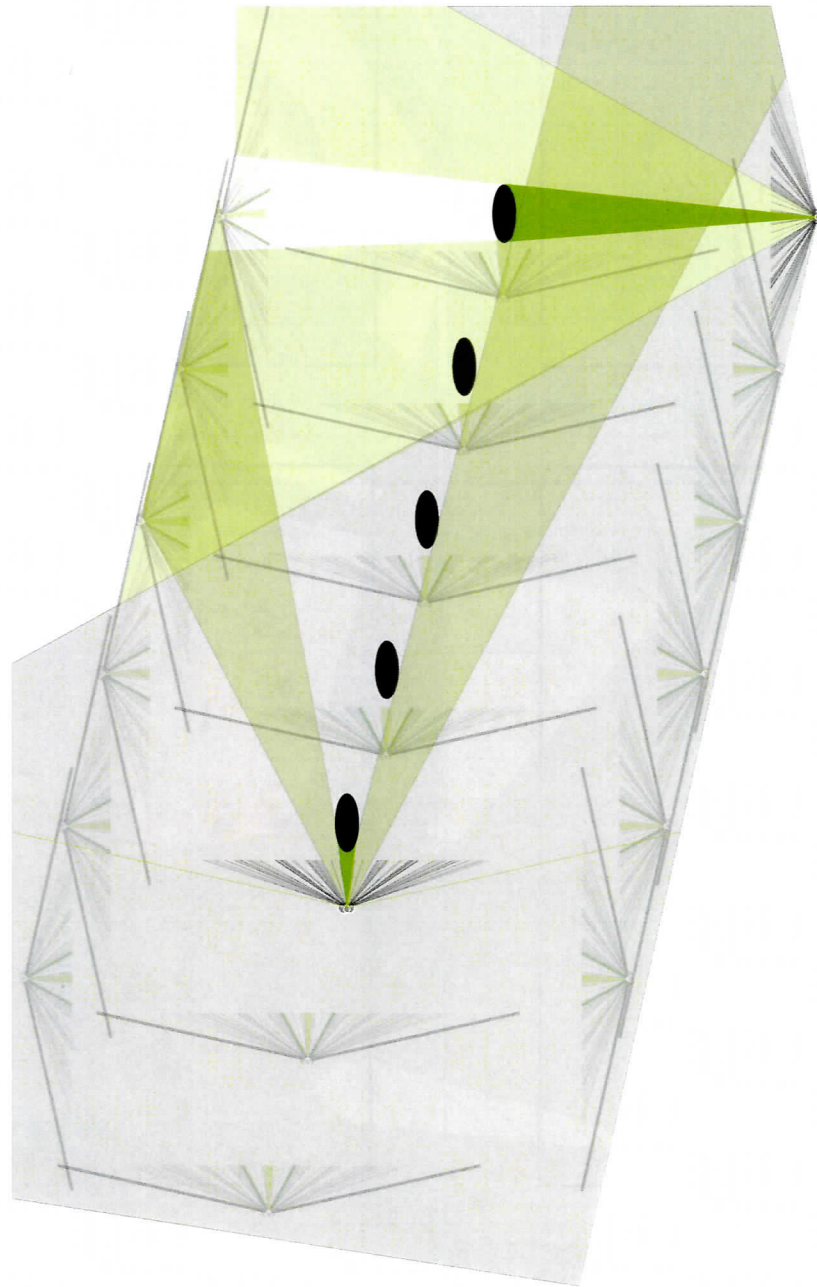
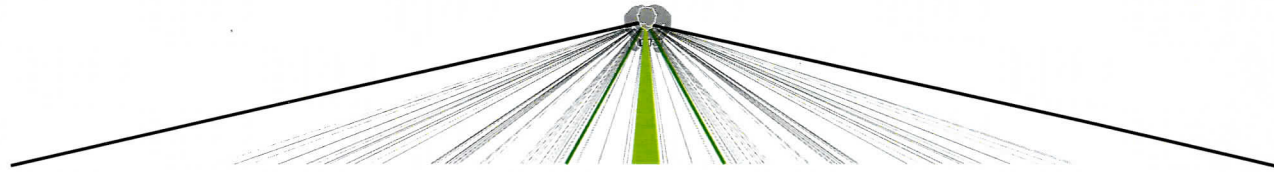


central vision

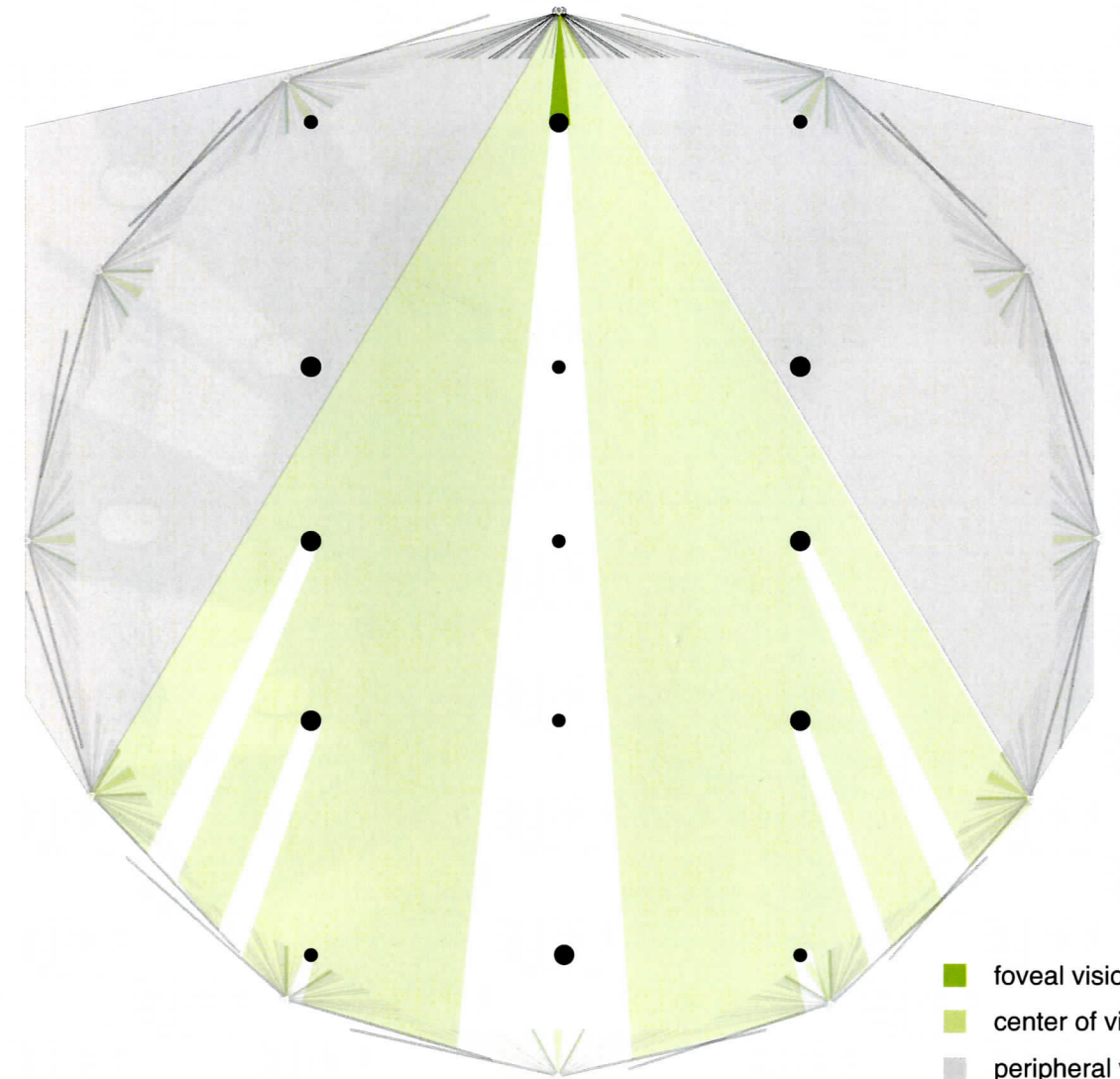
foveal vision

peripheral

Open Peripheral Fields: Scheme 1

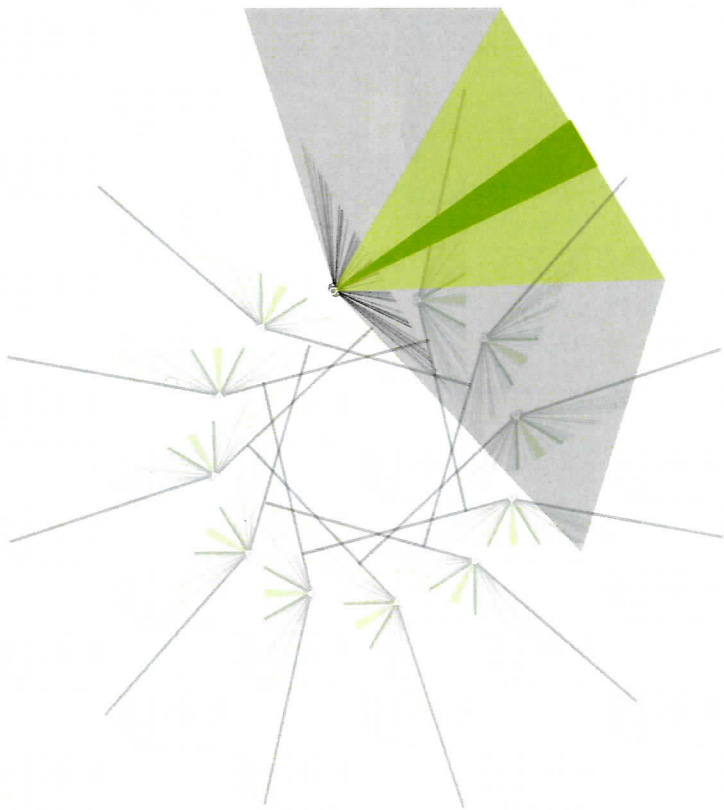


Open Peripheral Fields: Scheme 2

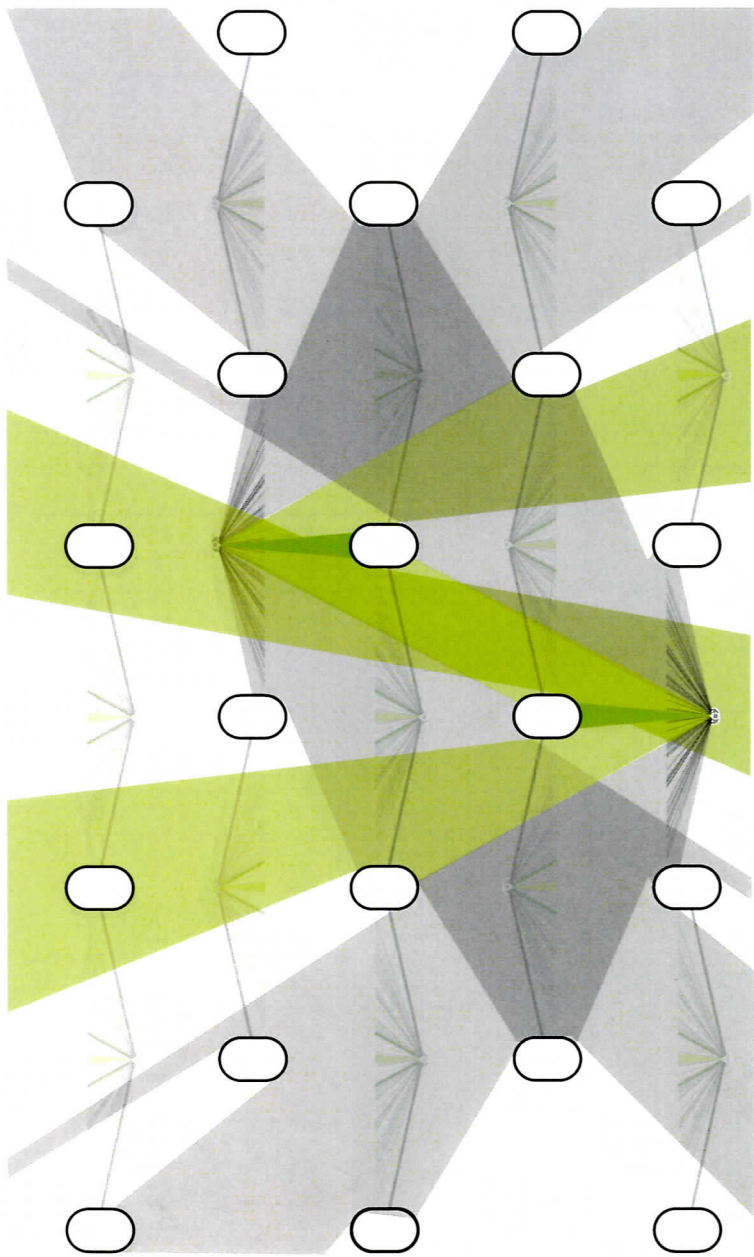
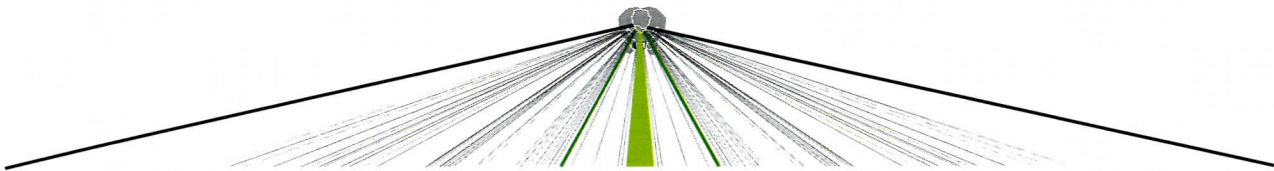


- foveal vision
- center of vision
- peripheral vision
- obstruction.

Open Peripheral Fields:
Scheme 3

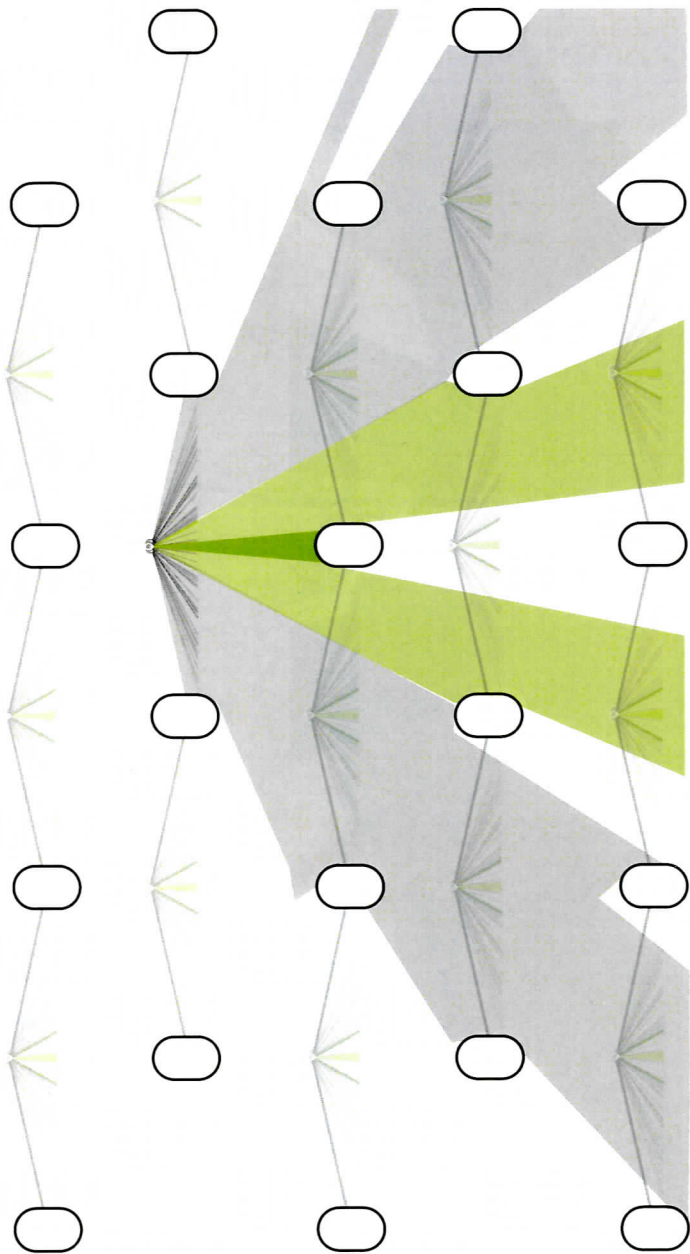
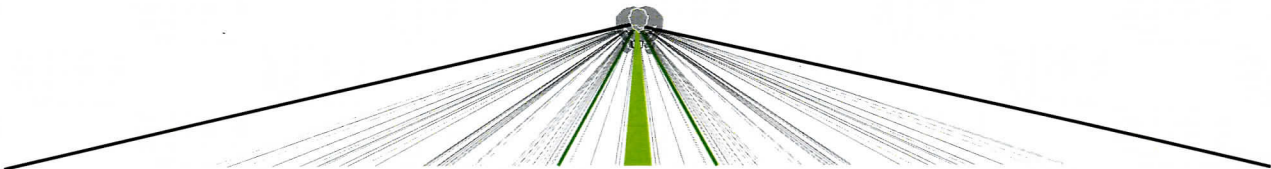


Open Peripheral Fields:
Scheme 4

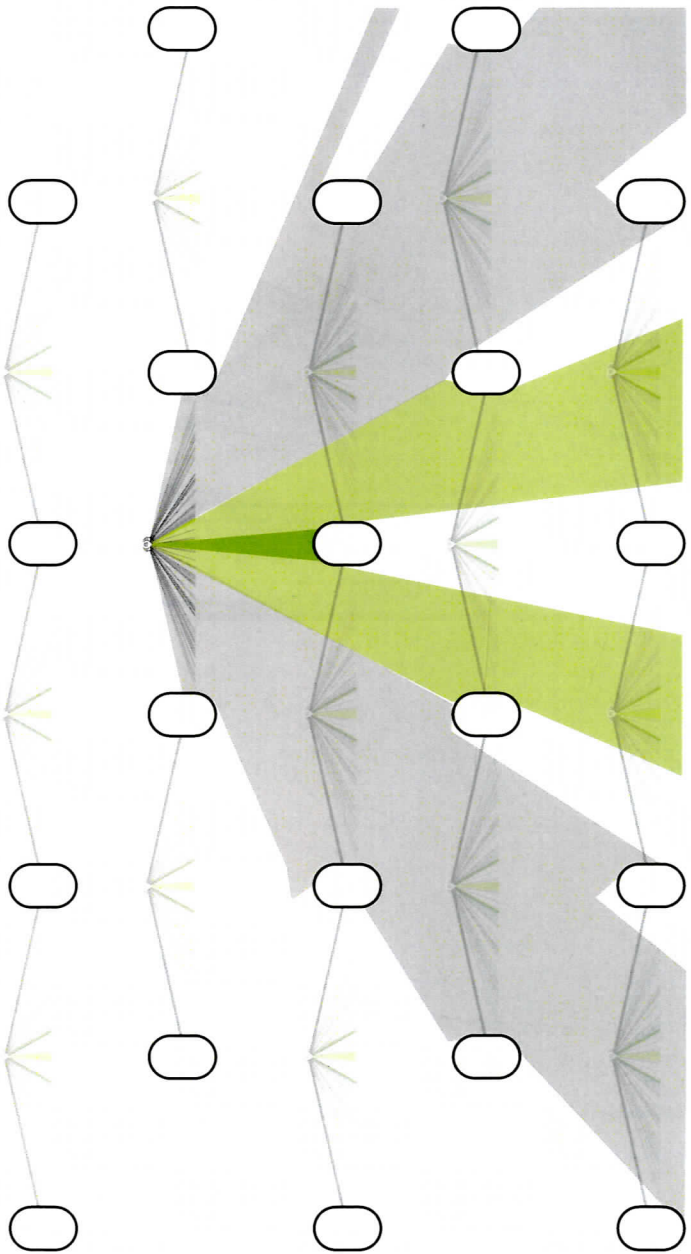
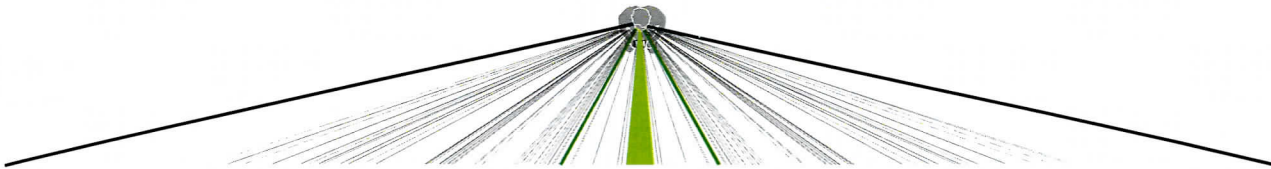


- foveal vision
- center of vision
- peripheral vision
- obstruction.

Open Peripheral Fields:
Scheme 5

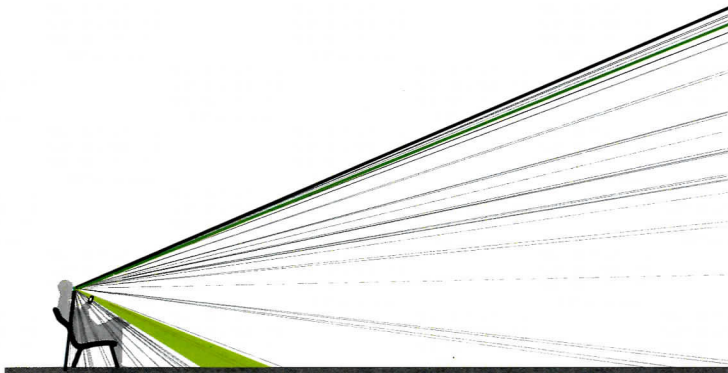
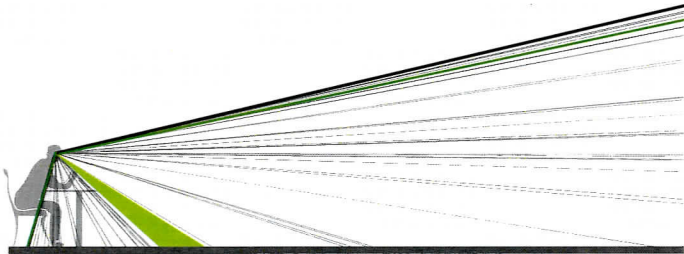


Open Peripheral Fields:
Scheme 6

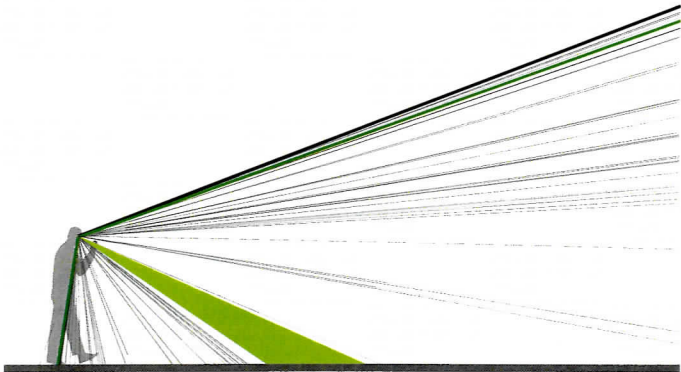
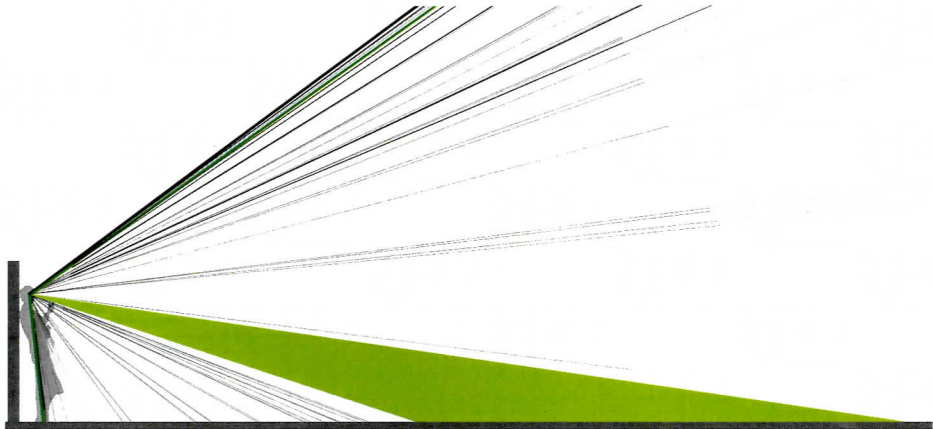
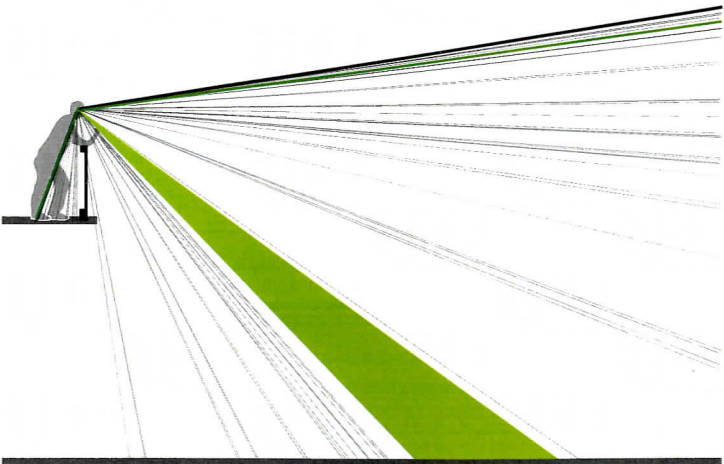


- foveal vision
- center of vision
- peripheral vision
- obstruction.

Posture Implications

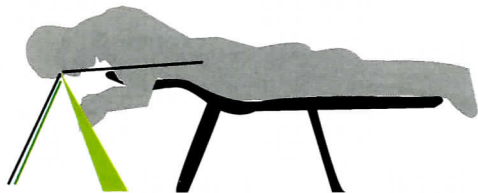
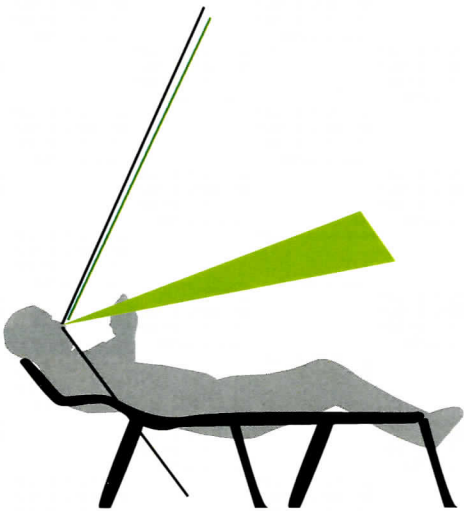
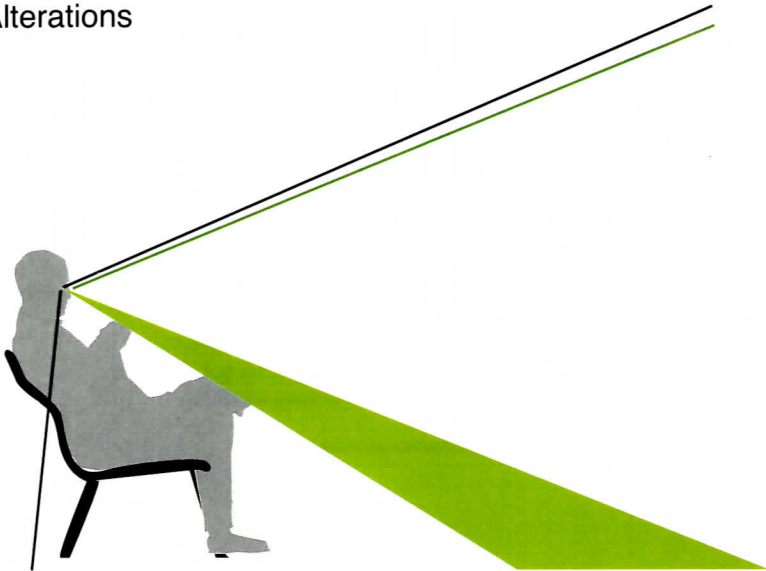


Peripheral Architecture



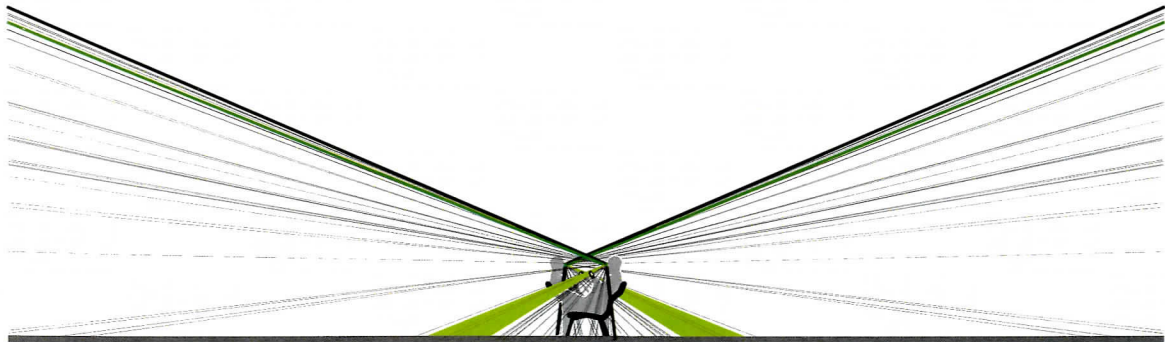
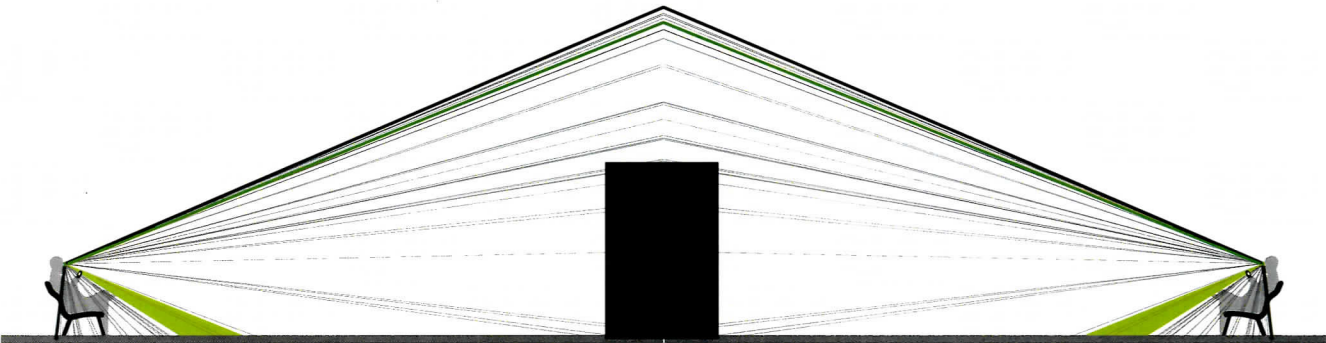
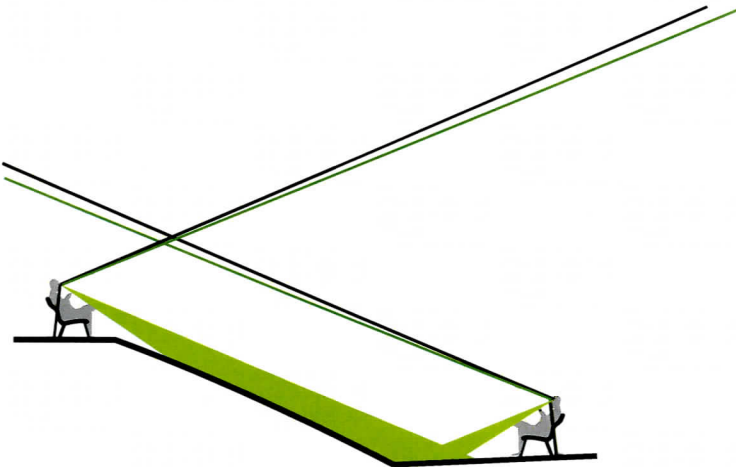
- foveal vision
- limit of central vision
- limit of peripheral vision

Posture Alterations

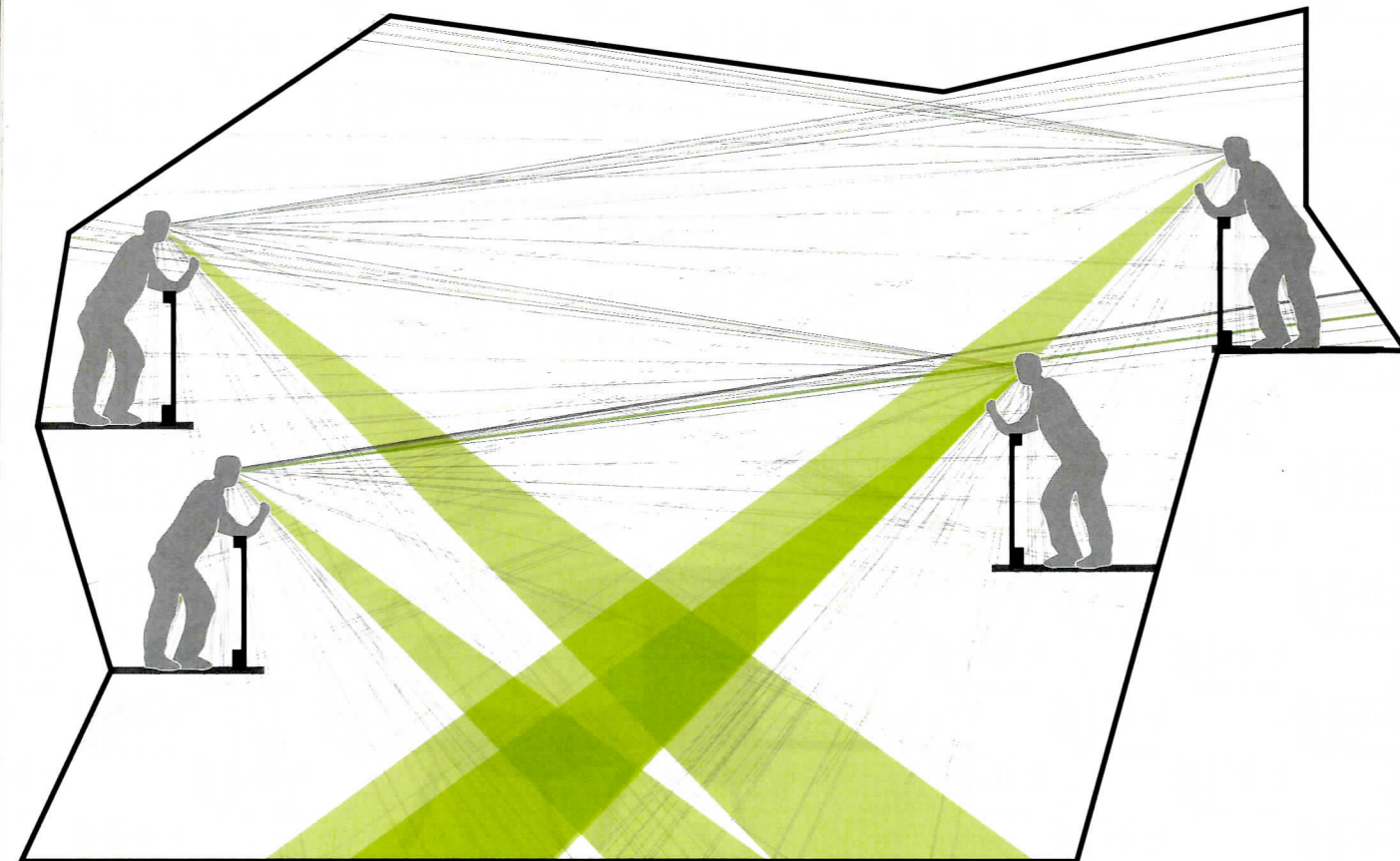


- foveal vision
- limit of central vision
- limit of peripheral vision

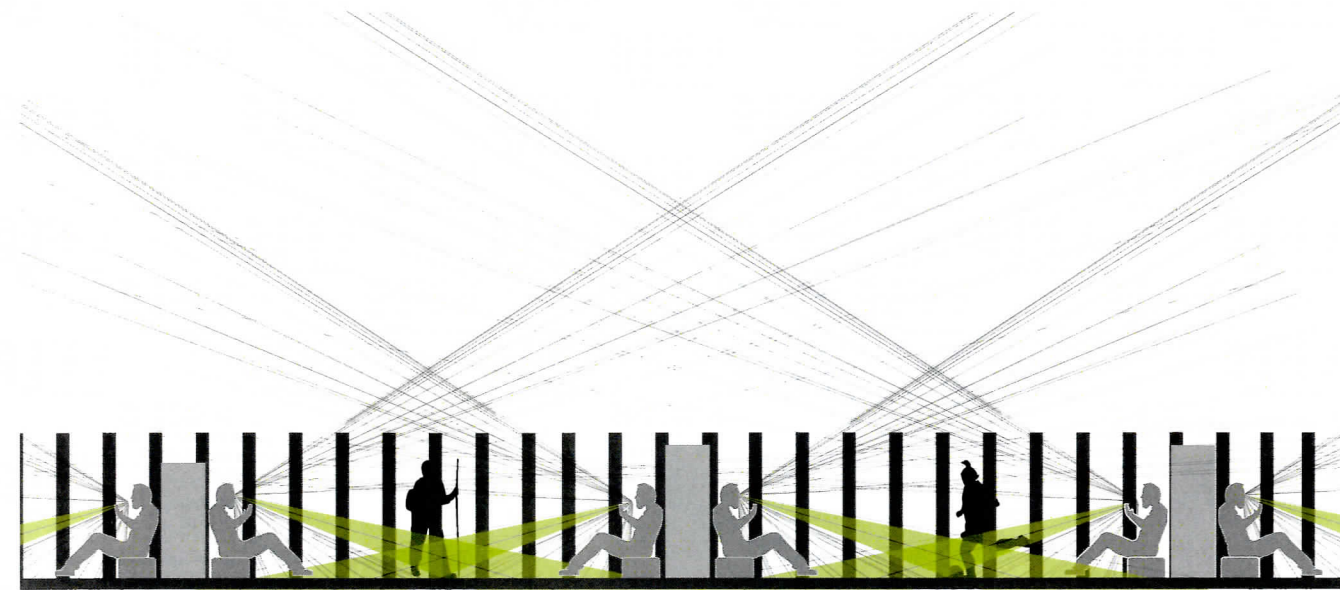
Sectional Reconfiguration 1



Sectional Reconfiguration 3

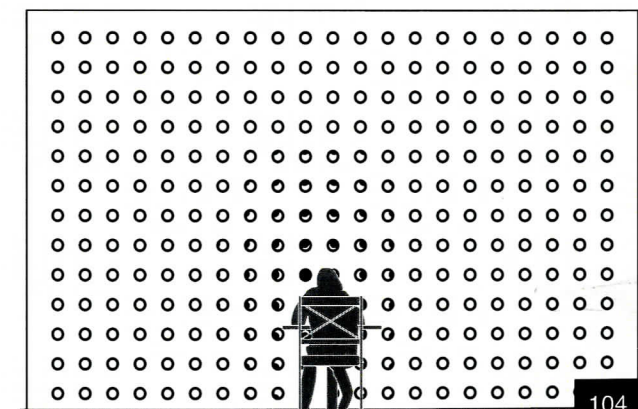
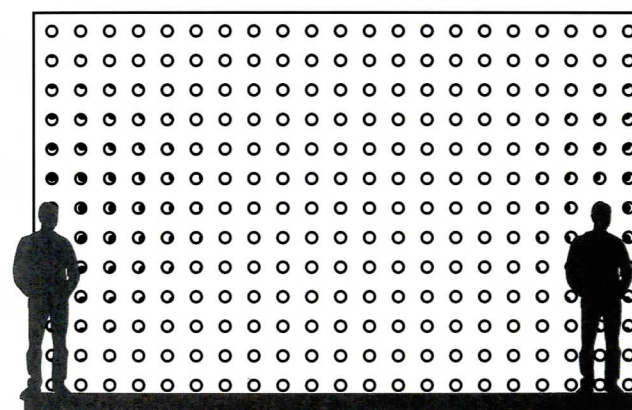
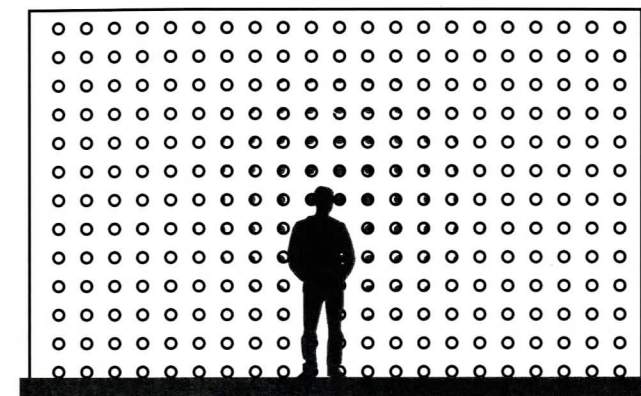
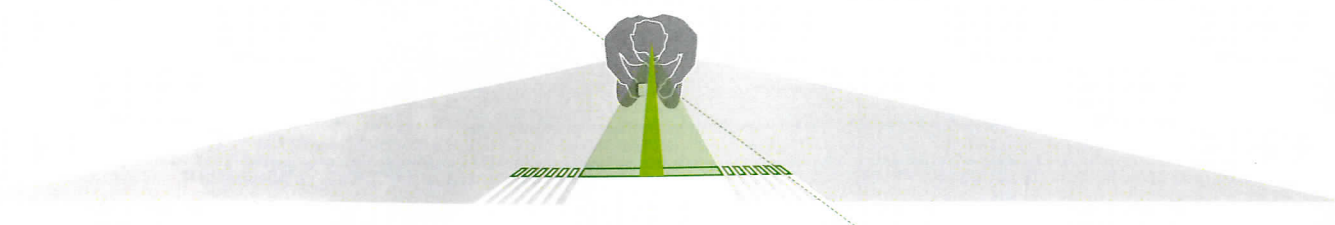


Sectional Reconfiguration 4: Exploiting Peripheral vision's emphasis on motion and contrast using pillars.



Skin Filtering:

Skins can select for peripheral angles of vision to provide a physical security from the field without a visual exclusion



Siting Strategies

In choosing a site it makes sense that it abide by two key criteria:

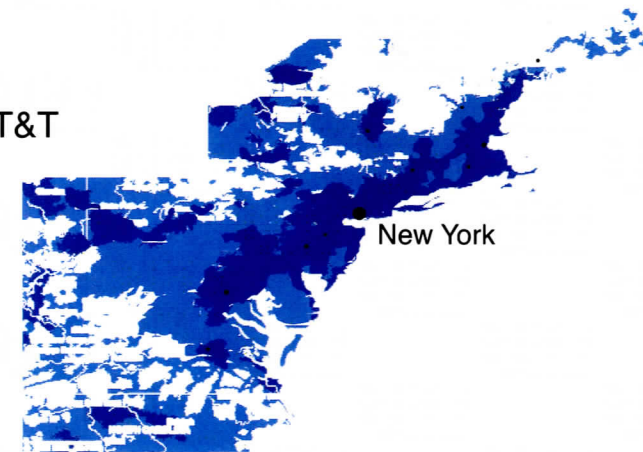
- 1) exceptional 3G or WiFi reception
- 2) Proximity to Nonspace

The Spaces behind Screenplaces:
Data Distribution
East Coast Wireless

Verizon



AT&T



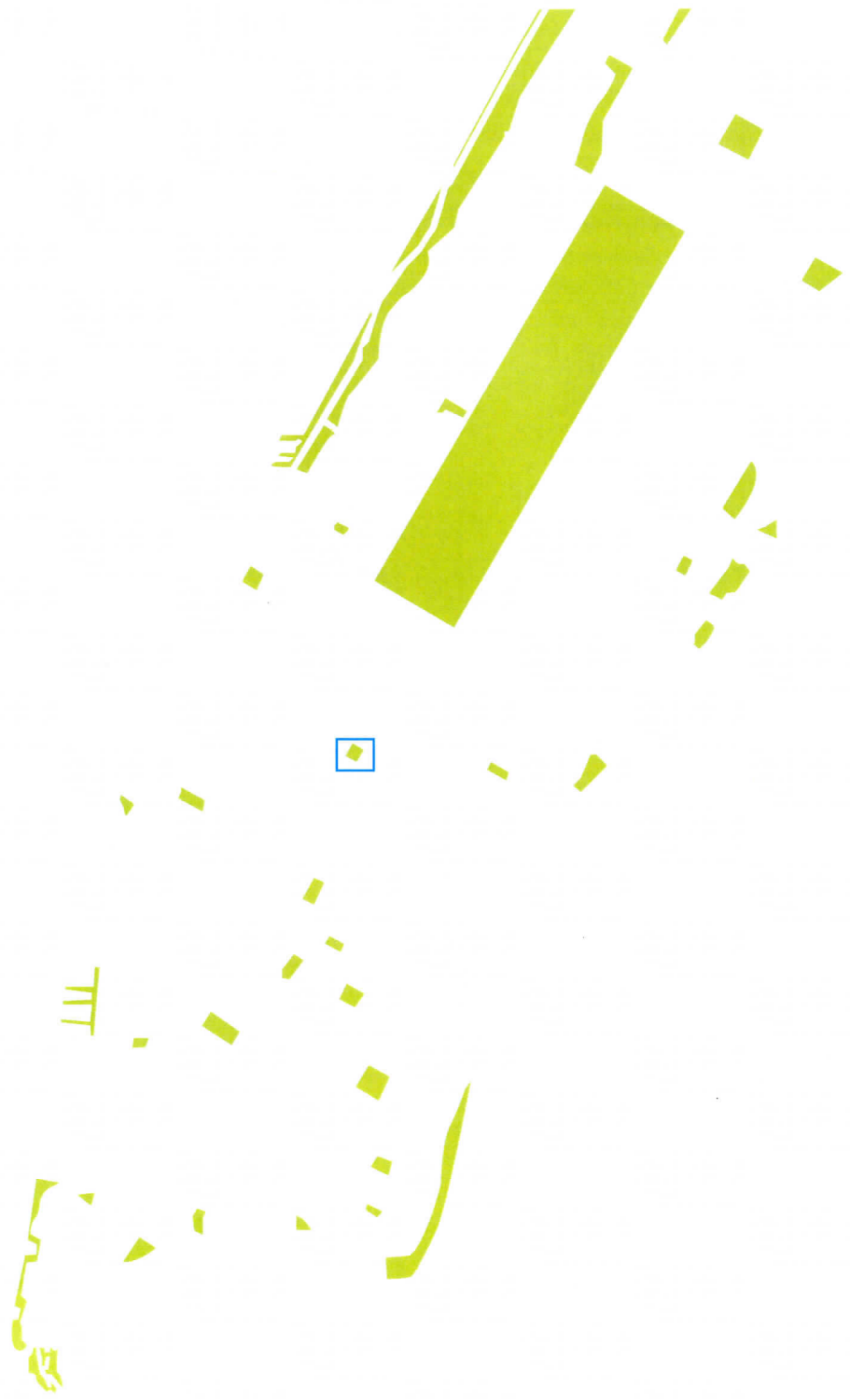
Sprint



The Spaces behind Screenplaces:
Data Distribution
Manhattan
WiFi



New York City
Public Parks



Potential Site

BRYANT PARK: Public Space with Comprehensive 3G coverage and free WiFi access within the Digital and Physical Distribution hub that is New York City



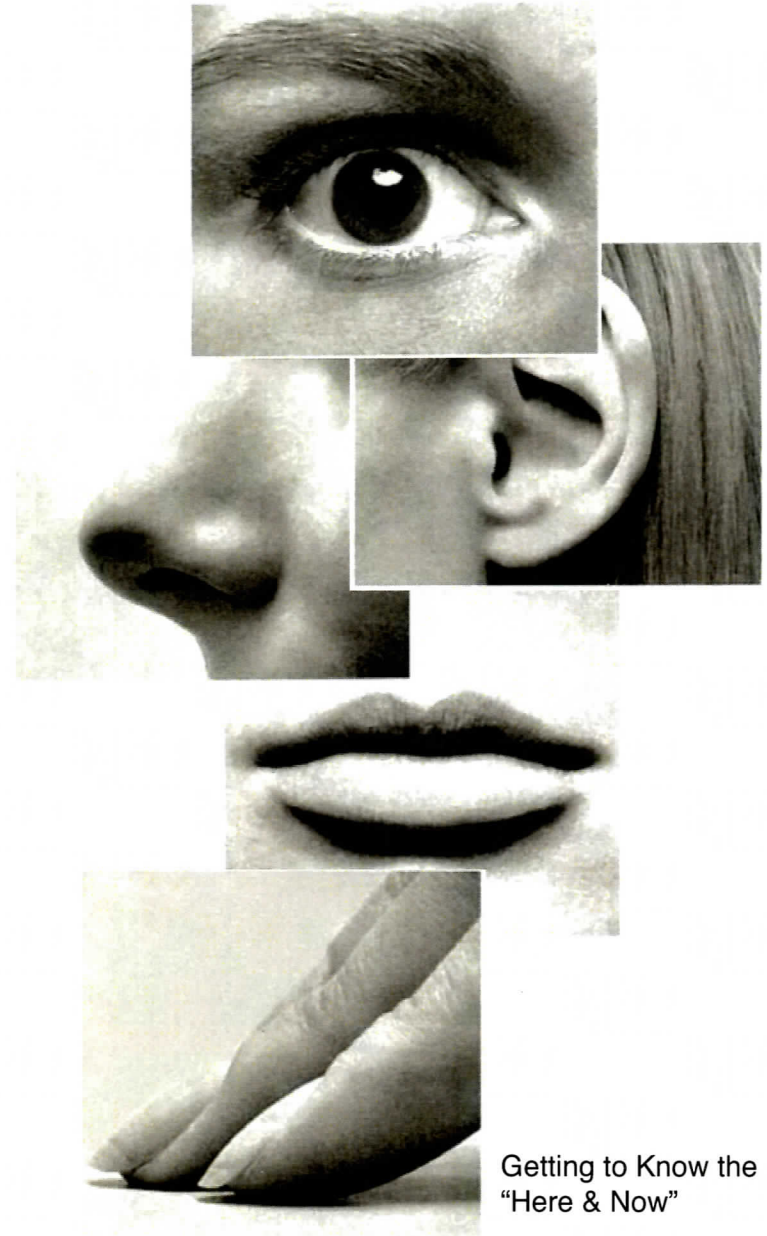
Google Earth

A peripheral architectural intervention of Bryant Park is enticing for several reasons beyond being in the heart of New York City and 3G network coverage. Bryant Park's relationship to the vectors of New York's grid is much like the screenplaces which emerged during the course of this study. Bryant Park is an experiential respite and defense from those walking along Madison or 6th Avenue and is already a place which marks transitions for along its east border East 40th and 42nd street transition to West 40th and 42nd.

Furthermore, Bryant Park begs attention for being one of the earliest parks in the North East to infuse the space with WiFi reception and is already a place for many to initiate transitions into the screenplace.

An engagement with the park would acknowledge the nonspaces in which it is embedded and seek to exploit the parks function as a social, work, and leisure space for those seeking brief relief or sustained engagement from the bustle of the city.

Appendix

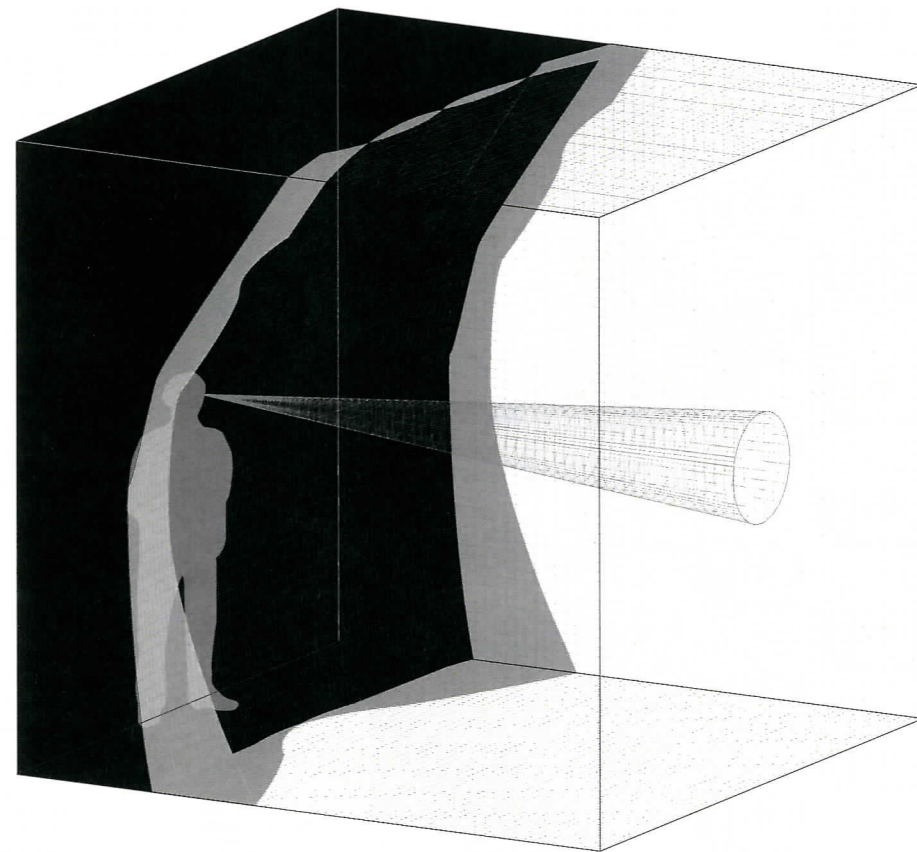


Getting to Know the
“Here & Now”

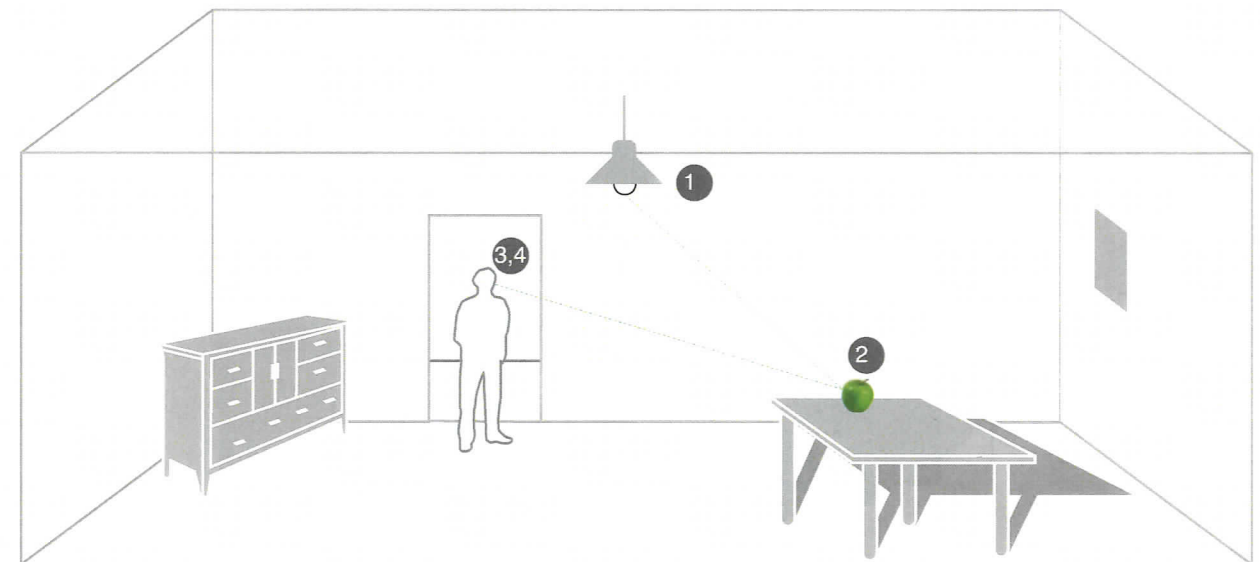
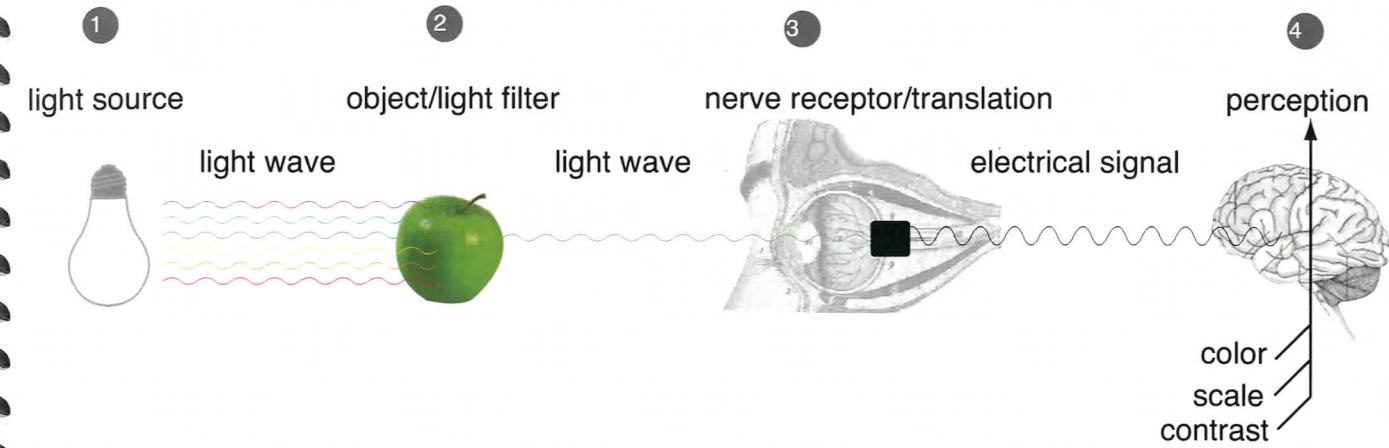


Vision + Context



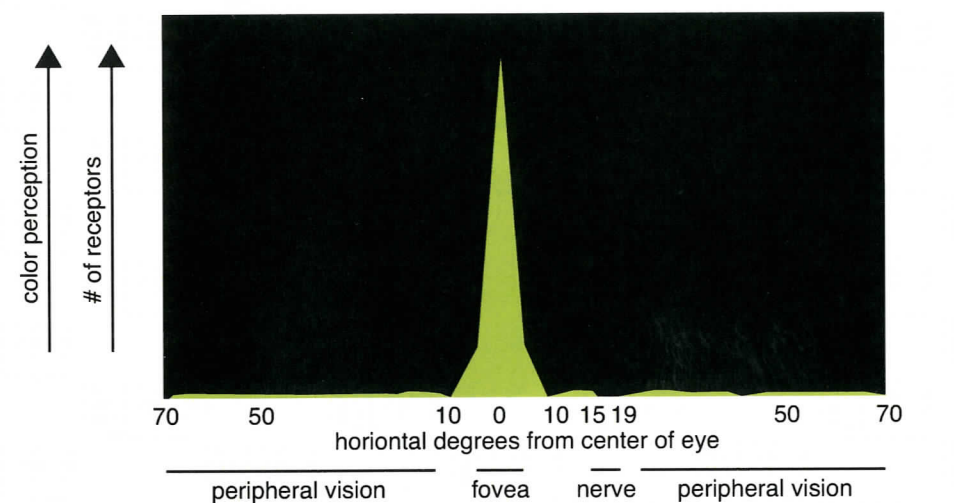


Visual Components

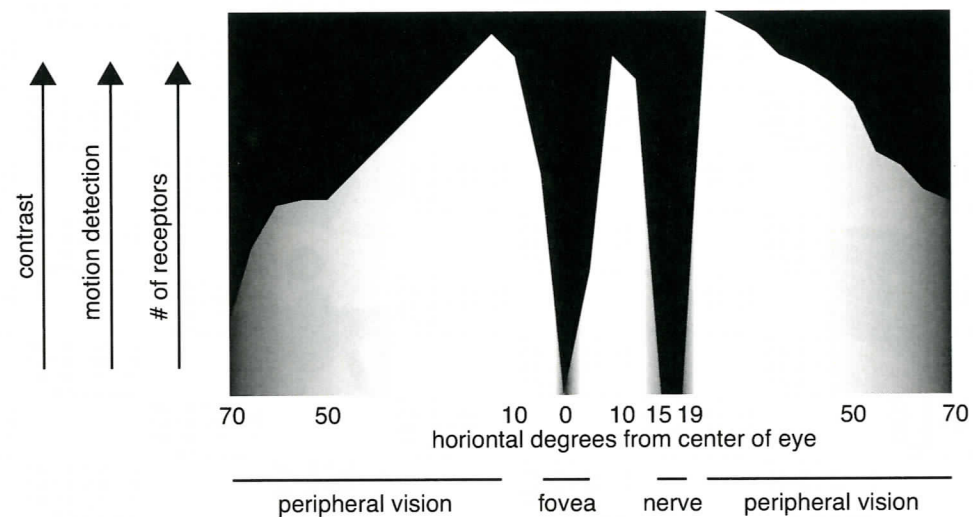


Visual Range

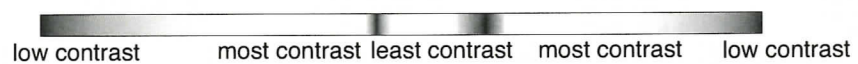
Location of Rods + Cones



Color Perception (cone)

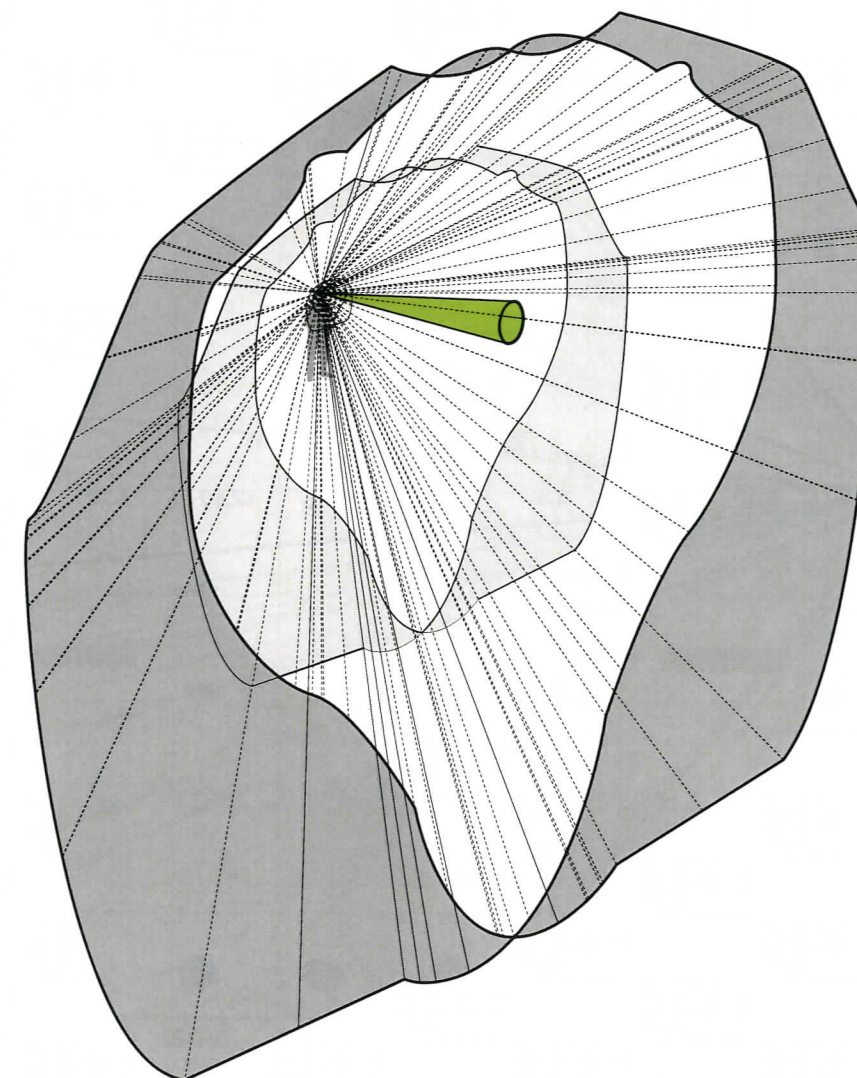
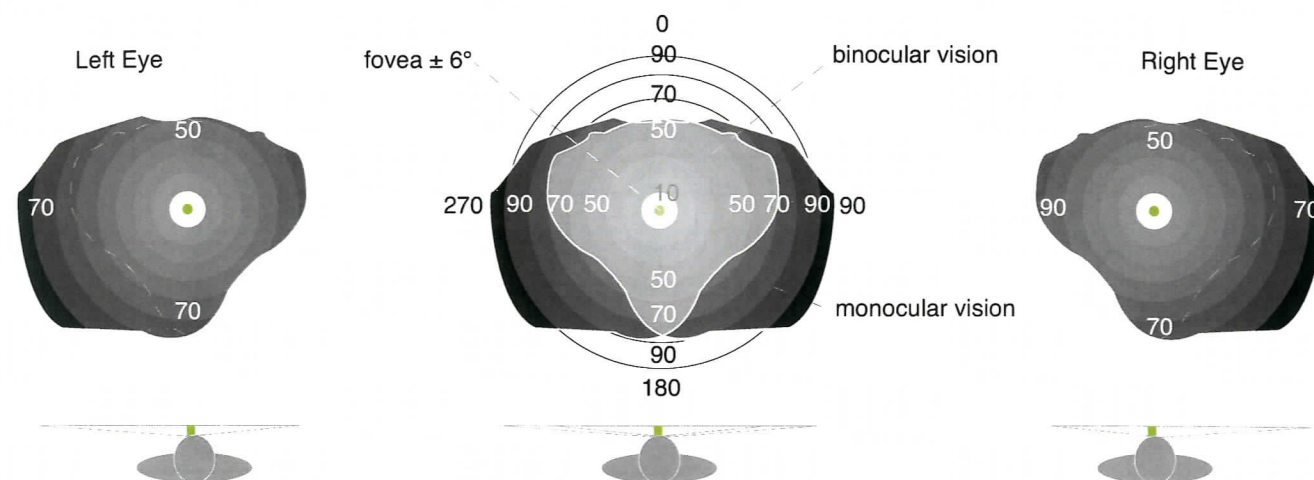


Motion and Contrast (rods)

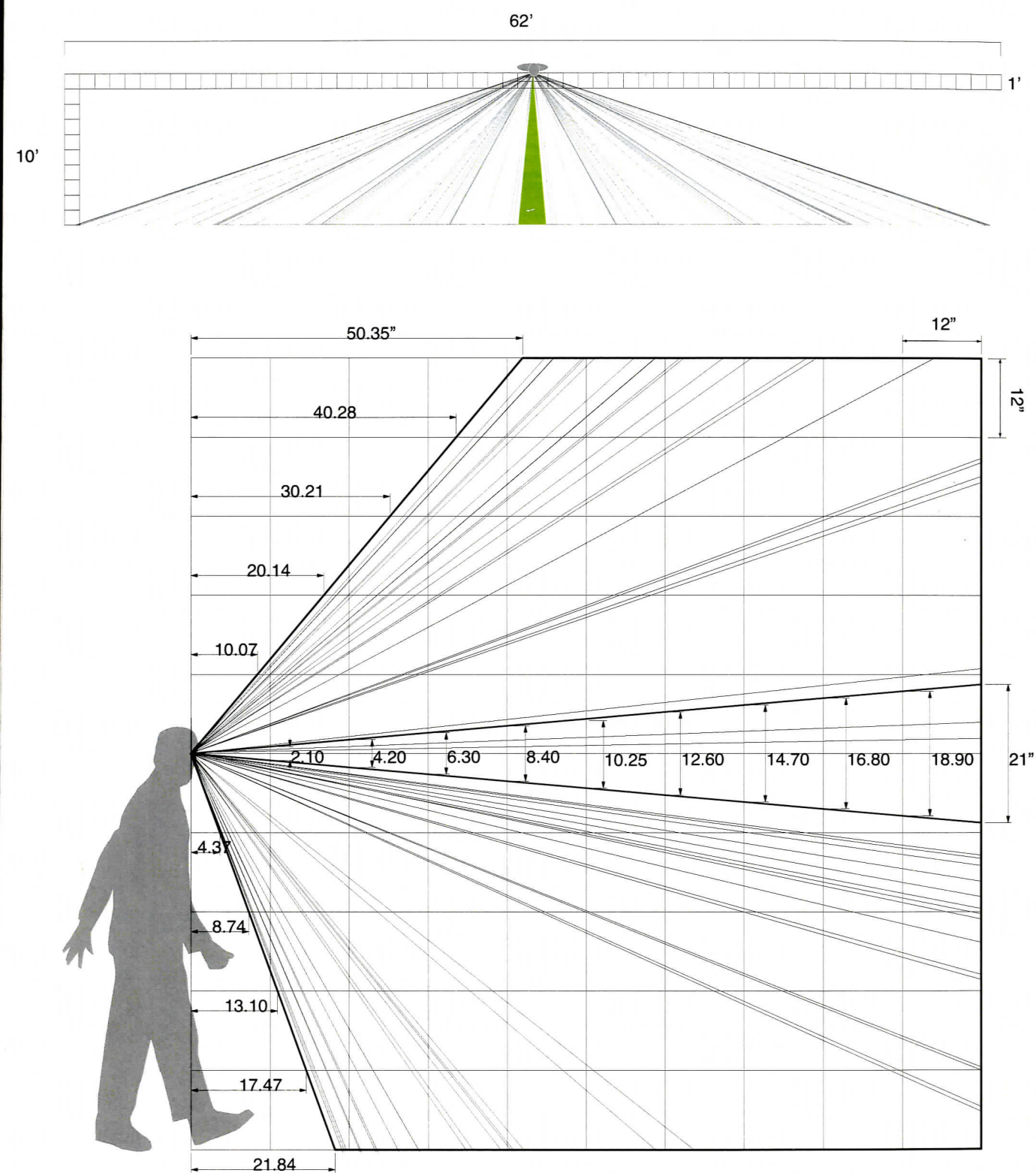


Visual Range

Peripheral Architecture

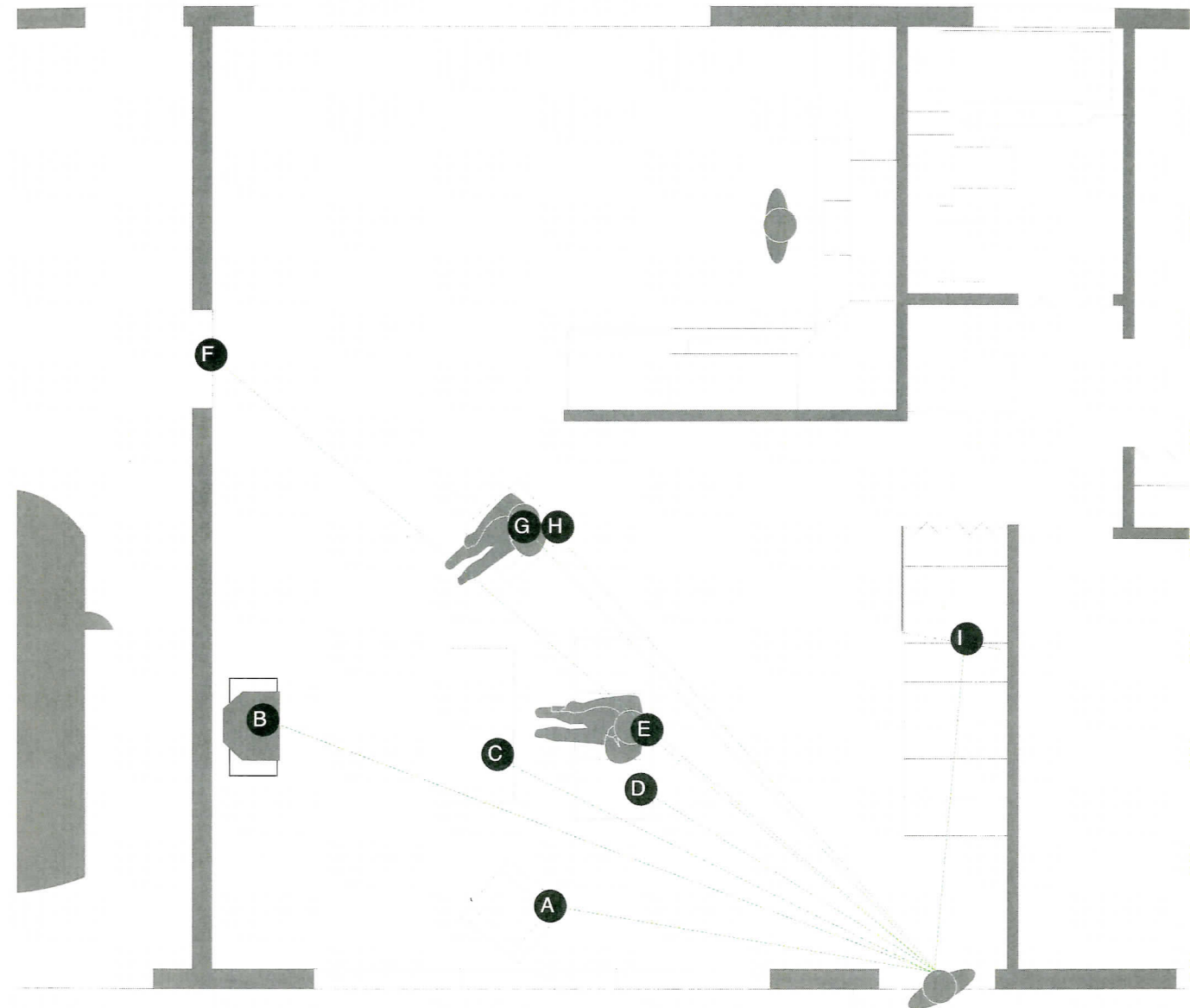


Visual Range

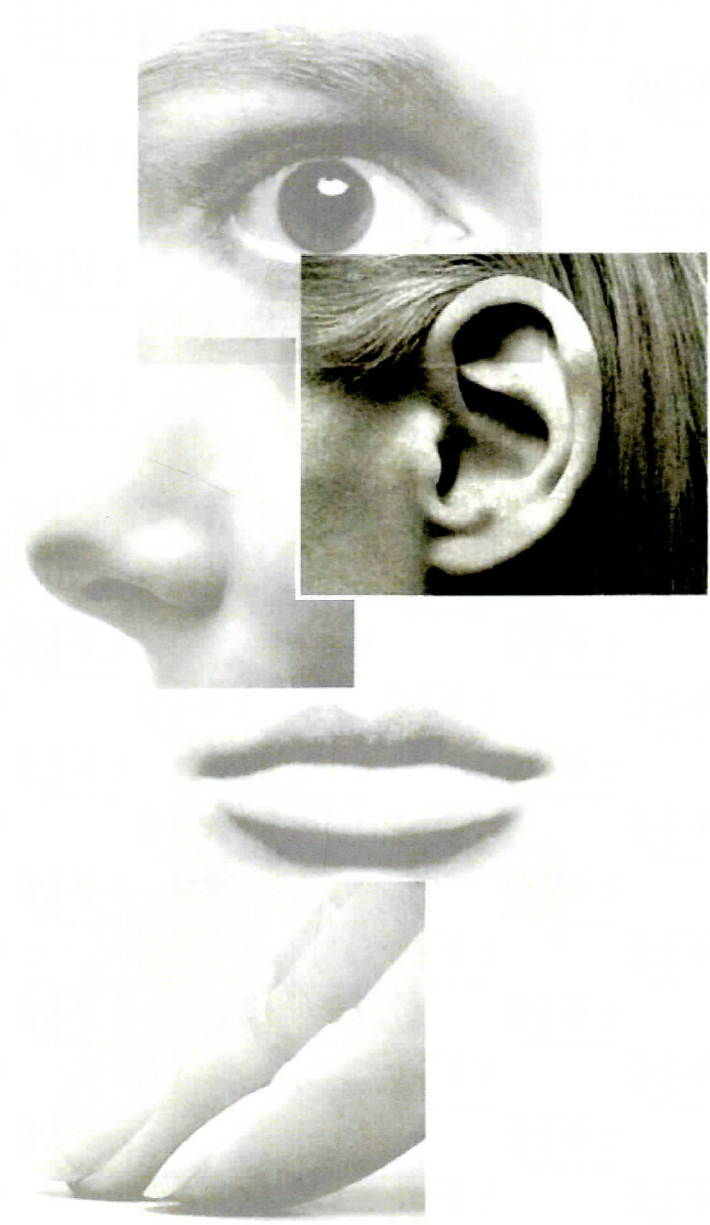


Space + Vision

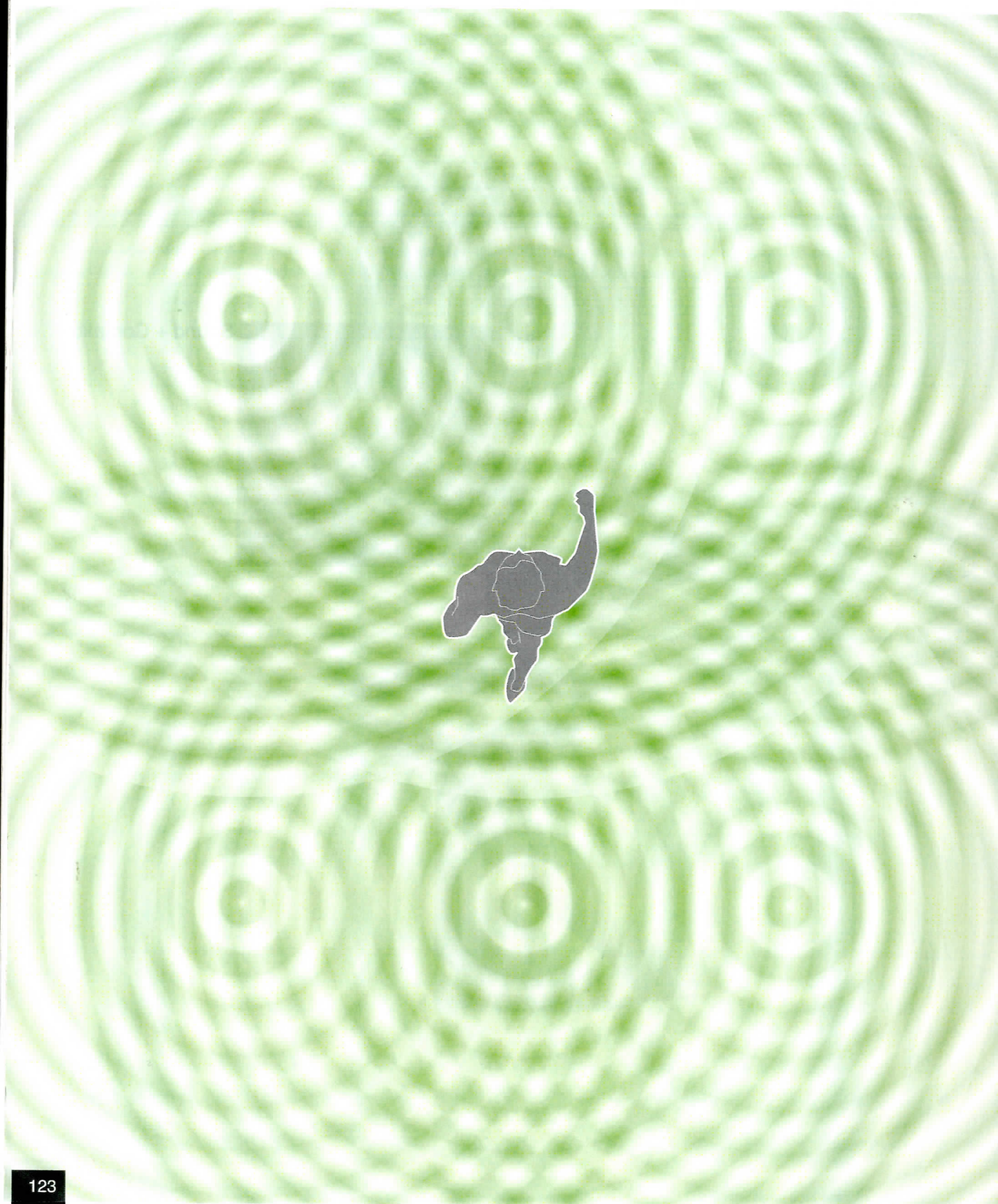
Landmark Identification



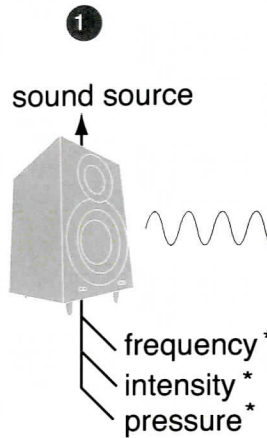
- A chair
- B tv
- C table
- D couch
- E person
- F door
- G person
- H chair
- I stairs



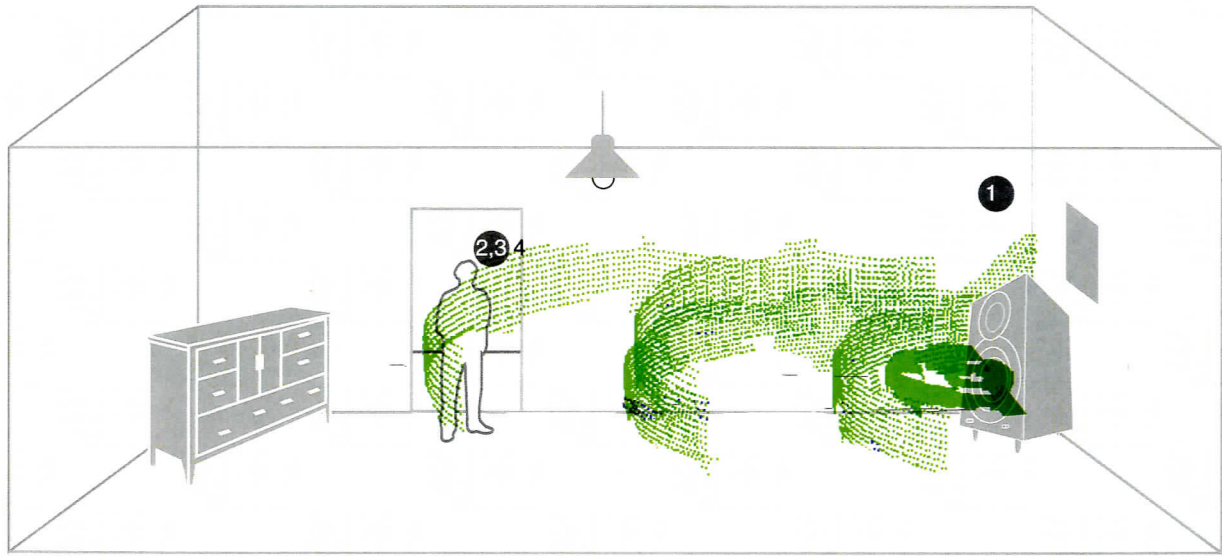
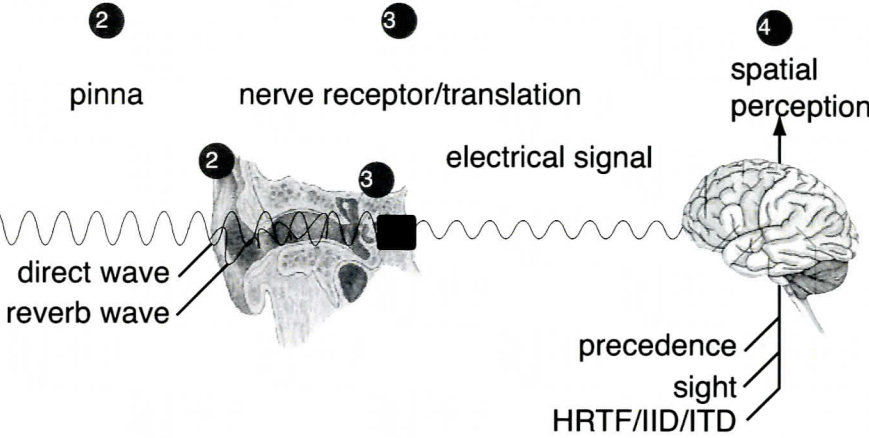
Sound + Context



Sound Components



Peripheral Architecture

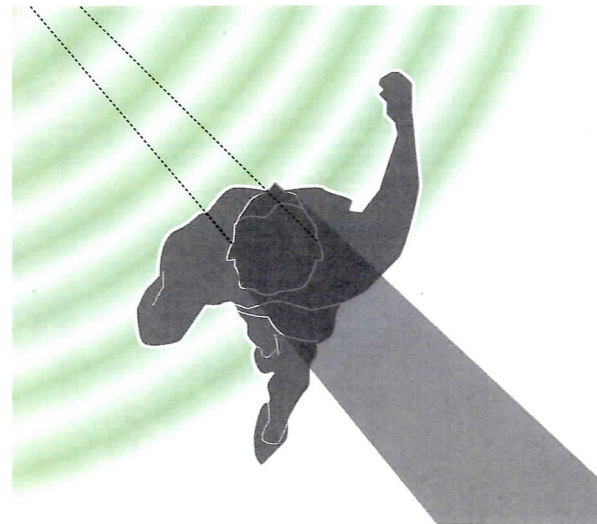


Audible range of the human ear.

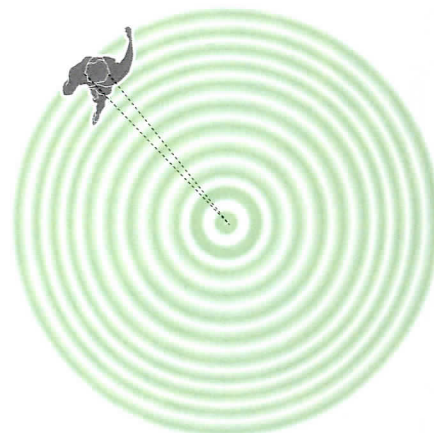
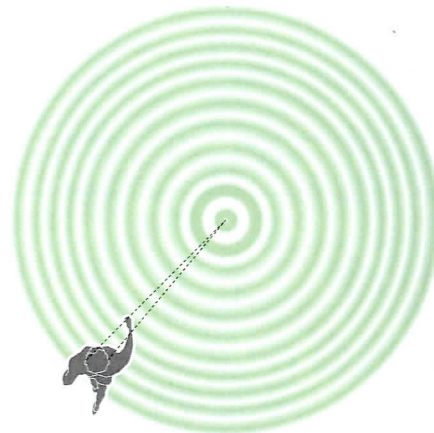
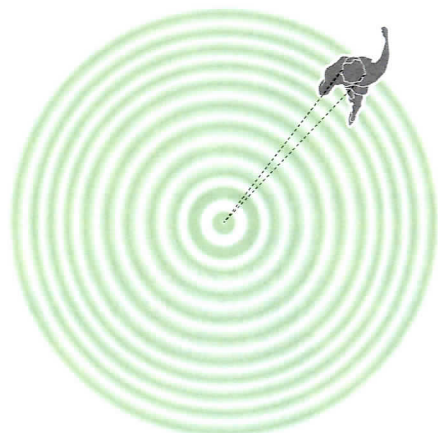
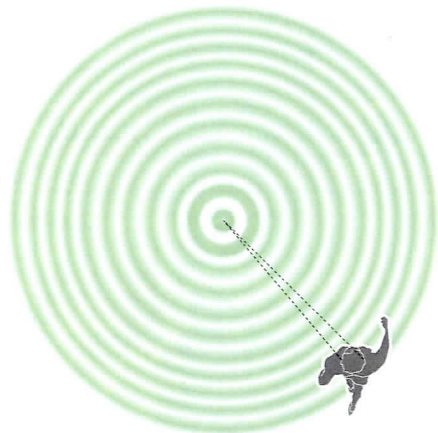
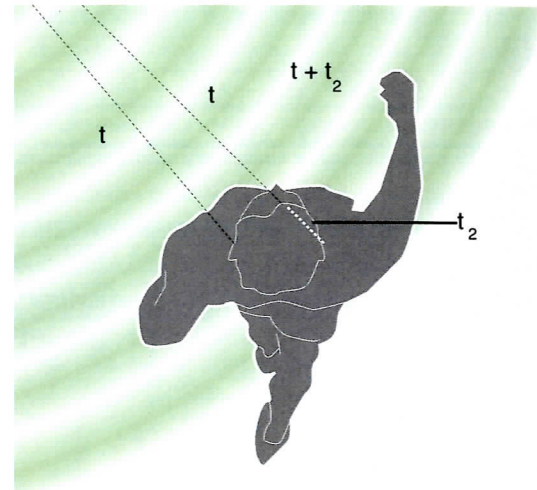
Quantity	Range
Frequency:	20 Hz - 20,000 Hz
Intensity:	$10E-12$ to $10 W/m\hat{A},\hat{A}^2$
Pressure:	$2E-5$ to 200 Pa

Sound Localization

Interaural Intensity Difference

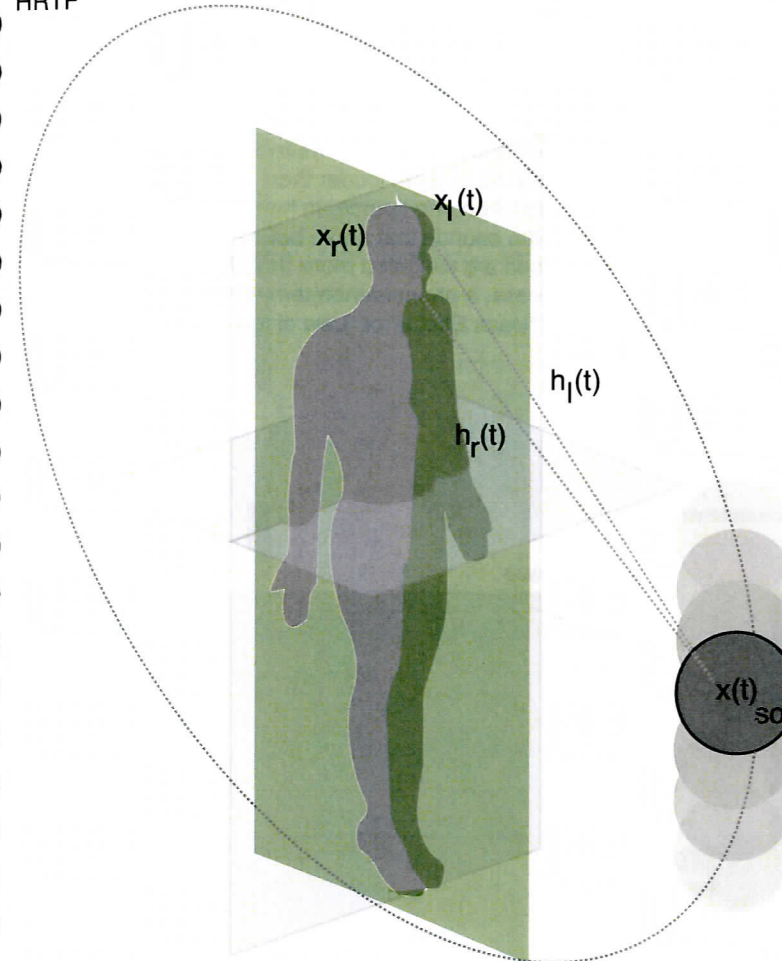


Interaural Time Difference



Sound Localization

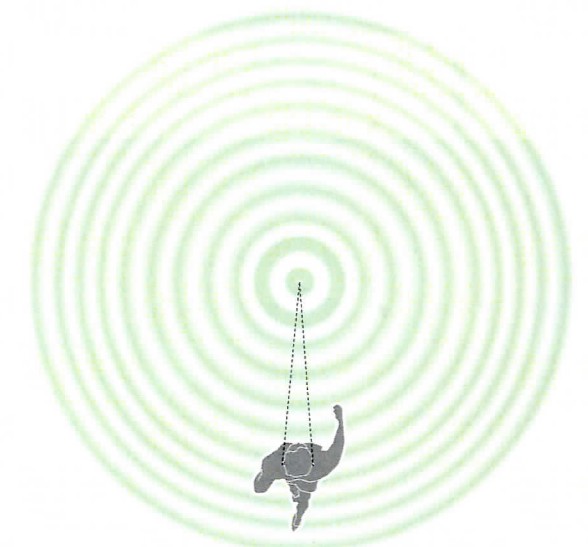
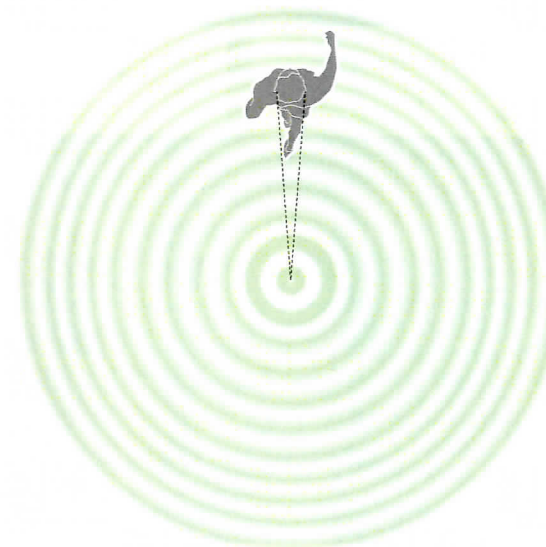
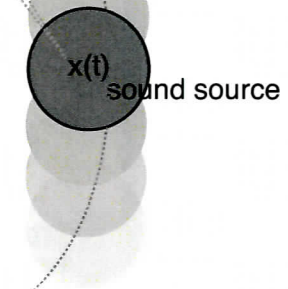
HRTF



The interaction of the pinna and a soundwave produces a reverberation. The angle and time difference between the direct path of a sound-wave and its reverberation helps us to locate sounds in the vertical plane. A mathematical translation of this process is referred to in sound design as the Head Related Transfer Function (HRTF)¹

HRTF is a calculation used in sound design which simulates the process of sound localization that would ordinarily occur as a result of the interaction between sound source, head location, and the shape of the outer ear (pinna). This brain process is especially useful when a sound source is directly in our medial plane and neither inter-aural differences in time or intensity yield much difference.²

$$x_l(t) = \int h_l(\tau) x(t-\tau) d\tau \quad x_r(t) = \int h_r(\tau) x(t-\tau) d\tau$$



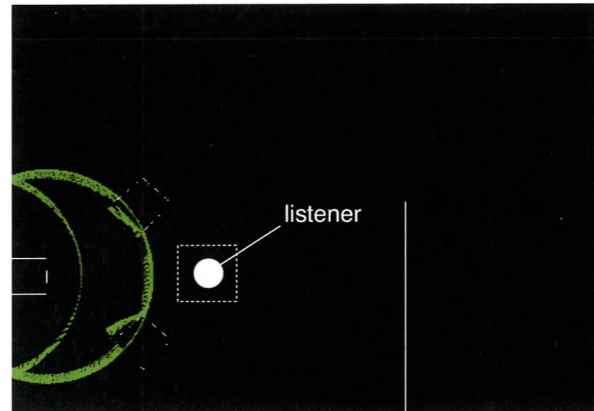
¹ Bears, Connors, & Paradiso, p. 379

² Goodridge, http://interface.cipic.ucdavis.edu/CIL_tutorial/3D_HRTF/3D_HRTF.htm

Sound Localization

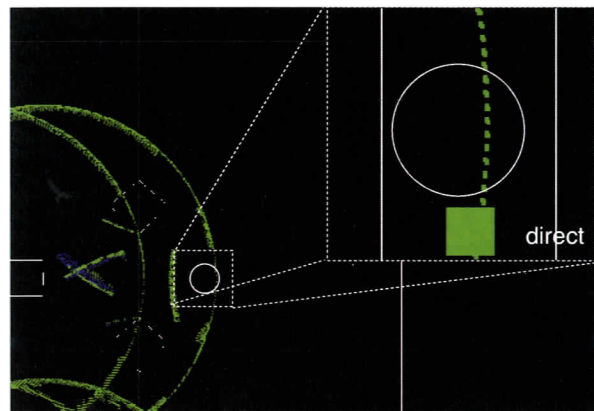
Law of the First Wavefront

sound origin

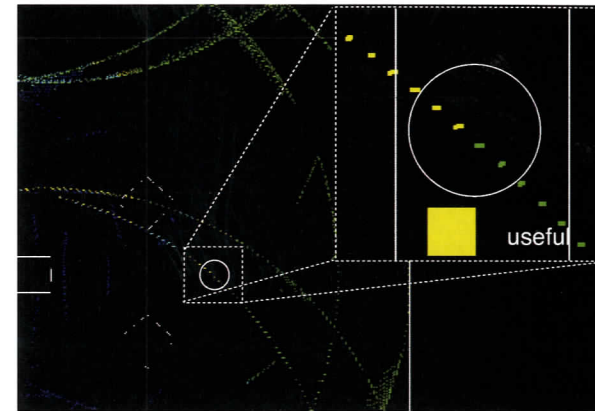


Echoes and reverberation caused by the environment pose difficulty for sound localization. Often the combined effects of multiple reflective sound paths can be as loud as or even louder than the sound traveling a direct path from the source. In humans, however, direct-path sounds that arrive before their corresponding echoes are weighted more heavily in the localization process, a phenomenon termed the "Precedence Effect," "Haas Effect," or "Law of the First Wavefront"

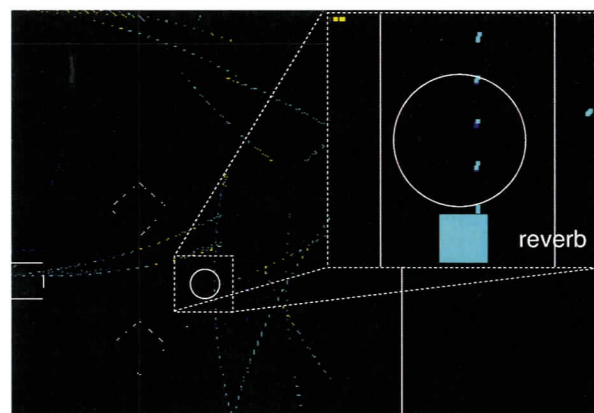
first wave



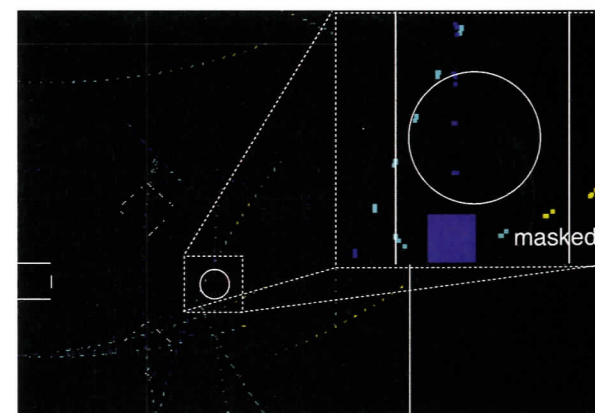
second wave



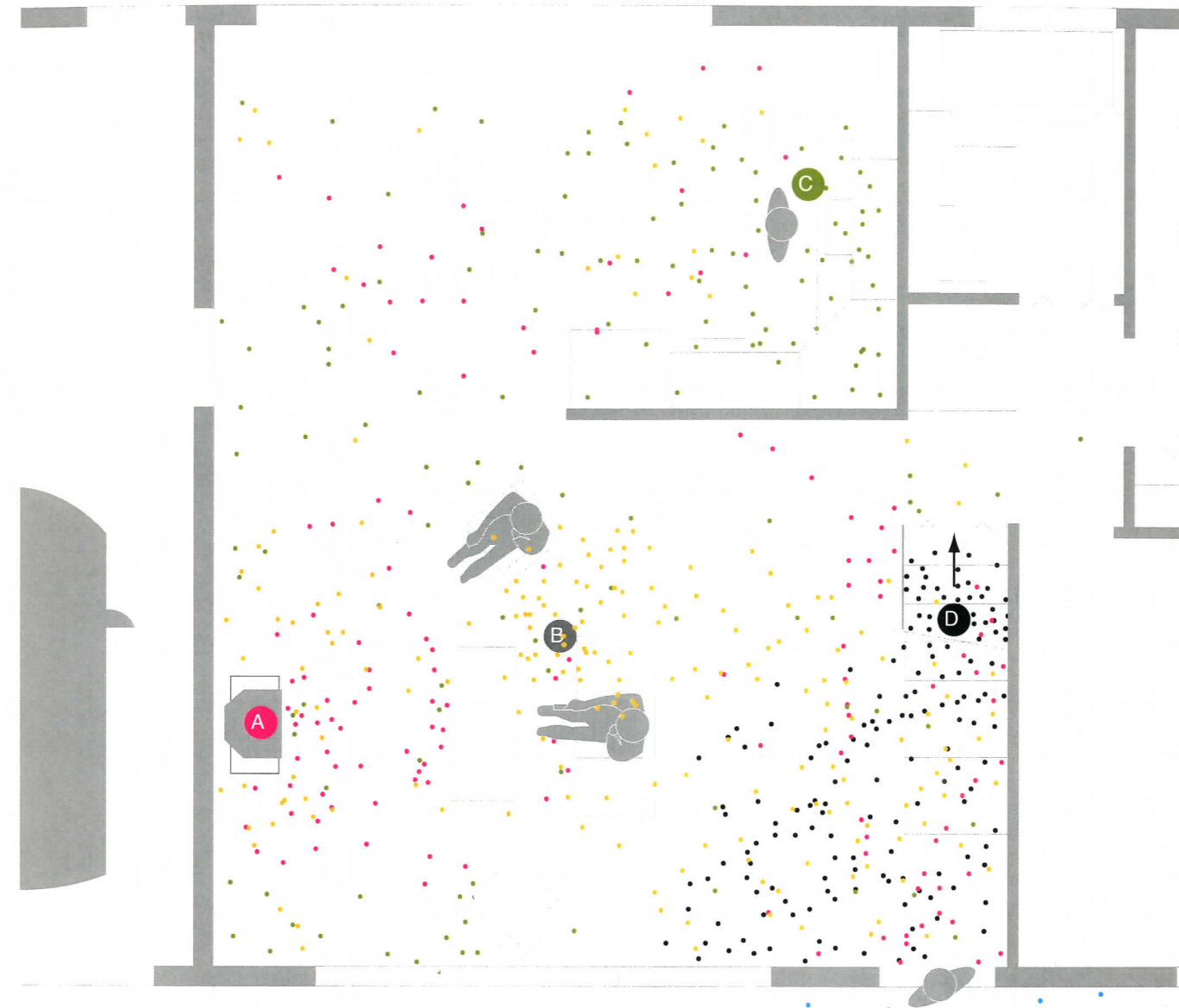
third wave



fourth wave



Sound + Context



A	B	C	D	E
television	conversation	disposal	stereo	wind
74 dBA	63 dBA	69 dBA	86 dBA	43 dBA

Scent + Context



Scent Range

4-Phenylcyclohexene

.03ppb

Trimethylamine

0.37-1.06ppm

Limonene

10ppb

Butyric acid

240 ppb

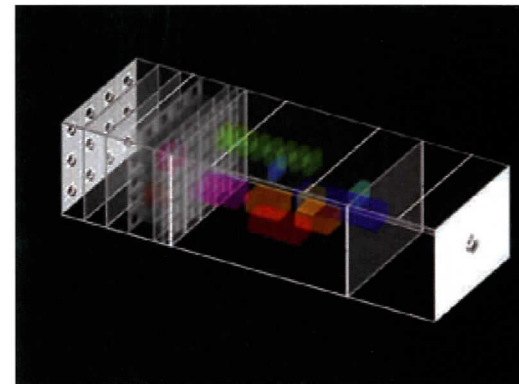
Styrene

730 ppb

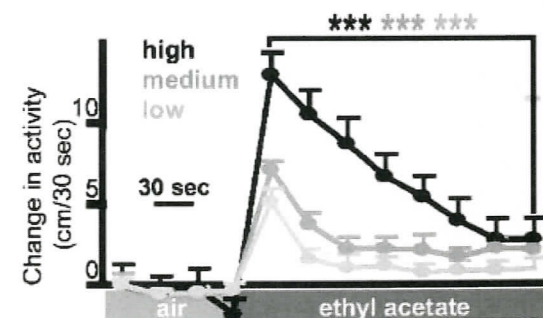
The range of a smell is dependant upon several factors. Each smell is actually composed of a series of chemical oderants, evaporated in the air and then stuck to the mucus in the epithelium. Whether a scent is detected is entirely dependant upon the oderant. Different oderants require different concentrations for detection, the critical concentration is called the odor threshold.

The dispersal of a scent is based on dissipation. Dissipation occurs naturally as molecules bounce off one another until they spread so thin as not to be detected. Air movement dissipates the molecules further. If a the concentration is great enough, wind can direct smells across great distances such as the smell of the ocean miles inland, or the smell of New Jersey's Frutarom factory detectable from Manhattan, over two miles away.

Usman Haque worked on a project called the Space of Smell in which several fans, directed through a series of filters disseminated multiple scents across a room adding an invisible dimension to the space.

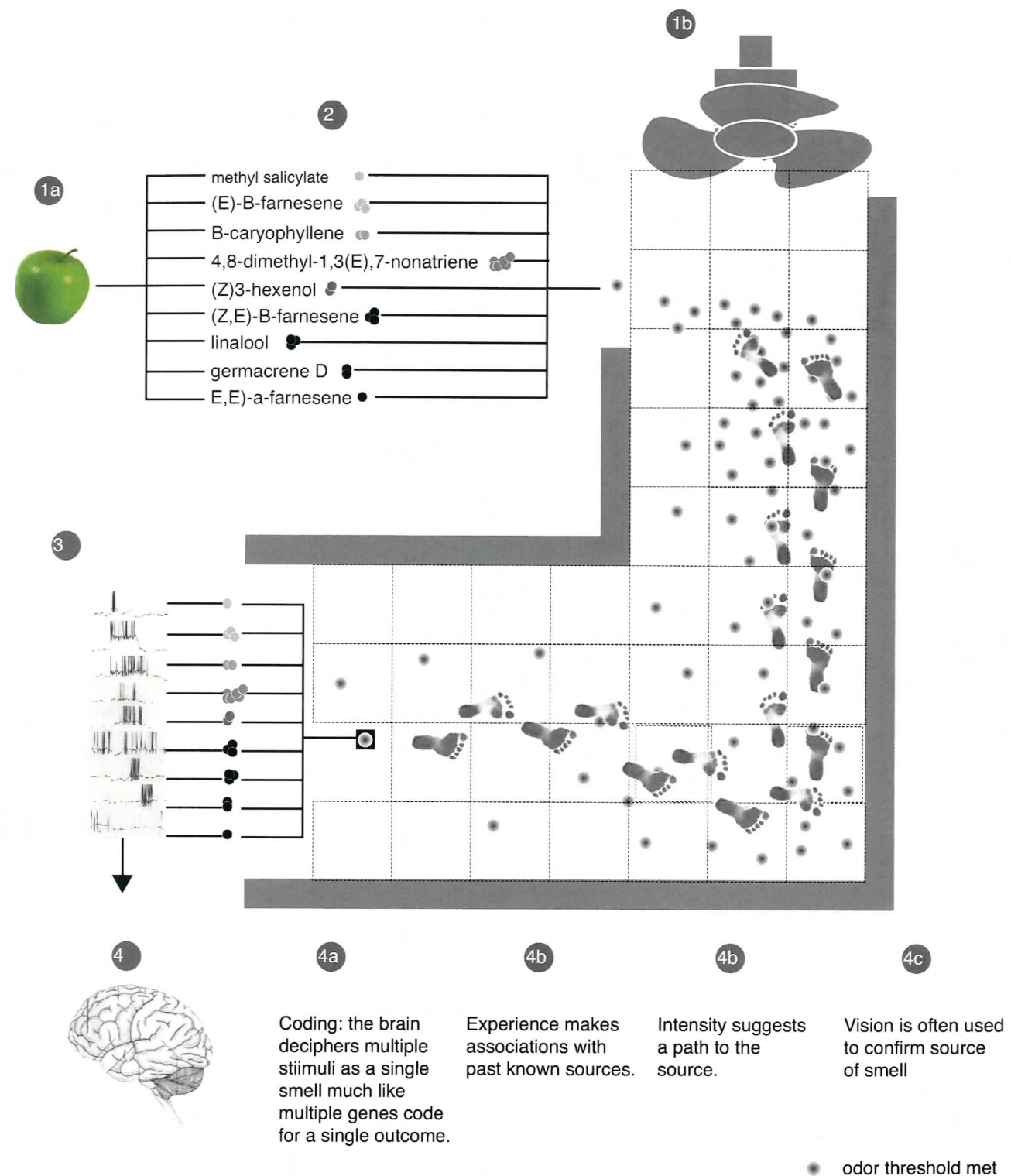


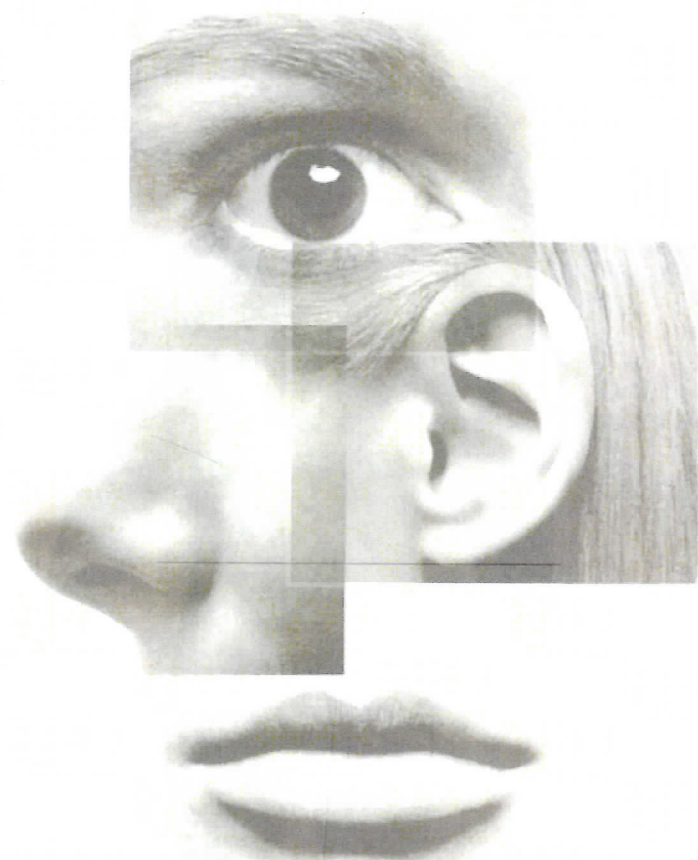
Usman Haque, Space of Smell (2002)



sensory inhibition:
over time sustained stimuli lose their ability to enact nerve firings. After 30 seconds the three levels of ethyl acetate are difficult to distinguish and have been greatly reduced

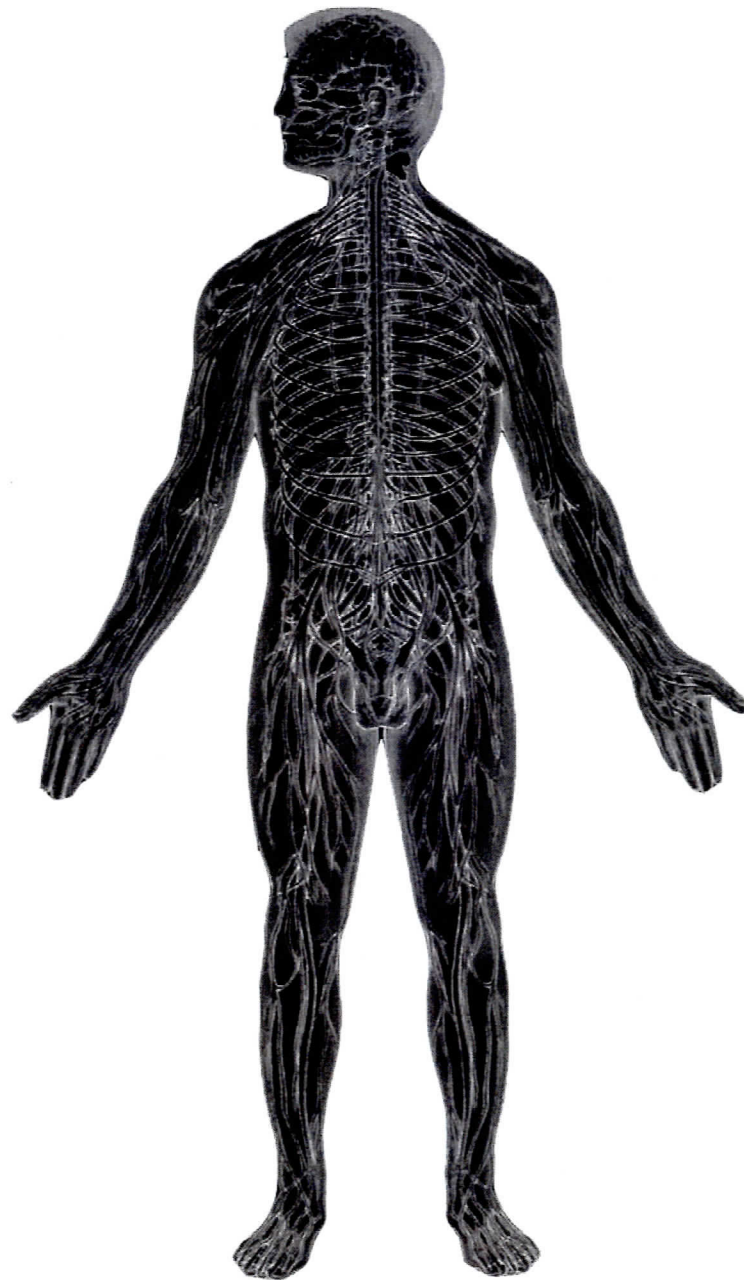
Scent Localization





Touch + Context





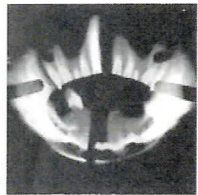
Touch Components

1

object



texture



temperature



body



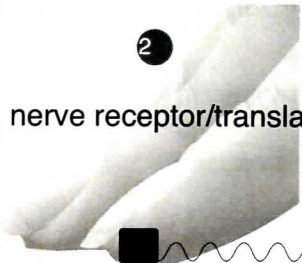
muscle and bone

Peripheral Architecture

2

nerve receptor/translator

mechanoreceptors



electrical signal

3

perception

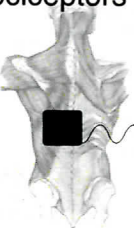


thermoreceptors

electrical signal



nociceptors (pain)



electrical signal



proprioceptors (body position)
muscular tension/contraction
angle/velocity/speed in joints

electrical signal



Mechanoreceptor Range

Two-Point Discrimination

Skin Sensation

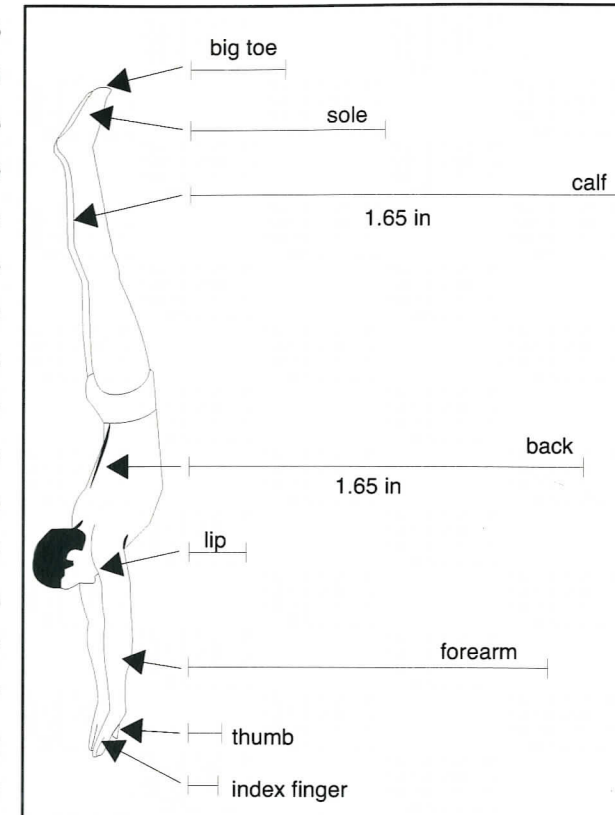


Illustration for the minimum distances required to perceive two stimuli as distinct (to scale). Neuroscience p 402



The humunculus is a rescaling of the body parts in accordance with their number of sensory neurons. from British Museum of Natural History.

The smallest threshold of mechanoreceptors is found in the index finger which can sense a raised dot as little as .006mm high by .004mm wide.

BIBLIOGRAPHY

Allen, Stan. "Dazed and Confused". *Assemblage* 27 (1995):47-54.

Augé, Marc *Non-places: Introduction to an anthropology of supermodernity*. trans. John Howe. London: Verso, 1995

Bear, Mark F., Barry W. Connors, and Michael A. Paradiso. *Neuroscience: Exploring the Brain 2nd Edition*. Baltimore: Lippincott Williams & Wilkins, 2001.

de Certeau, Michel. *The Practice of Everyday Life*. Berkeley: University of California Press., 2002.

Goodridge, Steven George. "Multimedia Sensor Fusion for Intelligent Camera Control and Human-Computer Interaction" Diss. North Carolina State University 1997. Raleigh: North Carolina State University

Heschong, Lisa. *Thermal Delight in Architecture*. Cambridge: The MIT Press, 1979.

McCullough, Malcolm. *Digital Ground*. Cambridge: The MIT Press, 2004.

Morse, Margaret. *Virtualities: Television, Media Art, and Cyberculture*. Bloomington: Indiana University Press, 1998.

Pallasmaa, Juhani. *The Eyes of the Skin*. Chicester, UK: John Wiley & Sons Ltd., 2005.

Tuan, Yi-Fu. *Space and Place*. Minneapolis: U. of Minnesota Press, 1977.

Zumthor, Peter. *Atmospheres*. Basel: Birkhauser, 2006